DOCUMENT RESUME

ED 363 118 FL 021 577

AUTHOR	Kidd, Richard; Marquardson, Brenda
TITLE	A Sourcebook for Integrating ESL and Content Instruction Using the Foresee Approach.
INSTITUTION	Manitoba Dept. of Education and Training, Winnipeg.
PUB DATE	93
NOTE	363p.
PUB TYPE	Guides - Classroom Use - Teaching Guides (For . Teacher) (052)
EDRS PRICE	MF01/PC15 Plus Postage.
DESCRIPTORS	Classroom Techniques; Communicative Competence (Languages); *Curriculum Design; Difficulty Level; Educational Strategies; Elementary Education; *English (Second Language); Foreign Countries; *Instructional Materials; *Interdisciplinary Approach; *Limited English Speaking; Media Selection; Second Language Instruction; Units of Study
IDENTIFIERS	*Content Area Teaching; *Foresee Approach; Manitoba

ABSTRACT

This sourcebook presents an approach to teaching students of English as a Second Language (ESL) that integrates communicative competence, cognitive and academic language development, and content instruction. It is intended for use by elementary school teachers of ESL and regular classroom teachers whose classes contain ESL students. An introductory chapter outlines the origins of the approach in language learning theory, cognitive and humanistic psychology, and educational principles, and describes the educational model in question. The second chapter discusses the application of the model to the selection and use of instructional materials, and the third chapter addresses lesson and unit planning. Three subsequent chapters present the following units: (1) an advanced unit on planets and space; (2) an intermediate unit on animals and their habitats; and (3) a primary unit on foods that grow. Each unit contains 8-12 lessons that target one or more content area, including language arts. The final chapter offers practical suggestions for integrating ESL students into the regular classroom, including such techniques as classroom organization, silent periods, classroom communication, treatment of errors, reading difficulties, and adaptation of instruction. (MSE)

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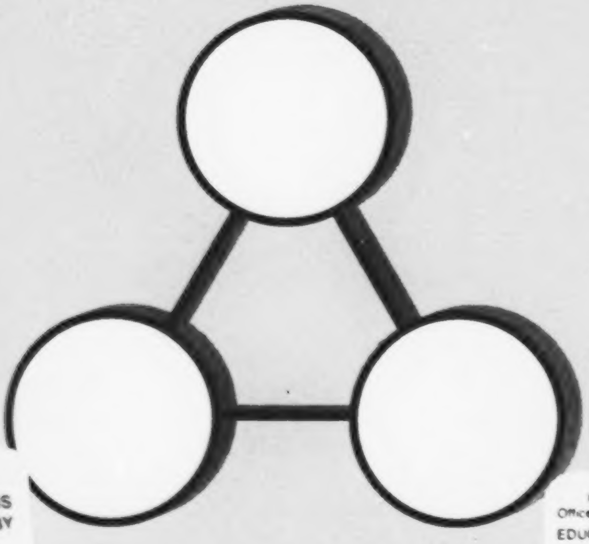
For Integrating ESL and Content Instruction Using the Foresee Approach



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A SOURCEBOOK

for Integrating ESL and Content Instruction Using the Foresee Approach

by

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1993

ACKNOWLEDGEMENTS

We would like to thank the publishers for their cooperation in the use of the following material:

1) *OXFORD UNIVERSITY PRESS*

Open Sesame ESL Series, Stage D: Prairie Dawn's Purple Book

pp. 74-75	two-page excerpt on the Solar System (text and picture) Activity 39 ("What's the Word?" Activity Sheet) Activity 42 ("Name that Planet" game - sheet)
pp. 74-75, Teacher's Book:	List of questions on the Solar System

The New Oxford Picture Dictionary

pp. 74-75	two-page excerpt	p. 74 "The Universe" p. 75 "The Space Program"

2) *ADDISON-WESLEY*

Addison-Wesley ESL Series, Level B

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	pp. 72-75	four-page story - "Presents for America"
Activity Book:	p. 14	Worksheet
	p. 52	Activity Sheet
Teacher's Edition:	p.157	Class Activity Master 7

3) *SANTILLANA PUBLISHING COMPANY*

Bridge to Communication, Primary Level B

	Poster 17
p. 47	Focus Sheet 9.3
p. 51	Student Worksheet 9.3
p. 46	Focus Sheet 9.2

4) *WINNIPEG FREE PRESS* - Photocopies of Articles

January 26, 1992, p.A4	"Spacewoman swamped"
January 23, 1992	"Bondar in heaven as Roberta rockets into space"
January 27, 1992	"Bondar on first shift in out-of-world lab"
January 27, 1992	"Bondar flips for Super Bowl"
January 27, 1992	"Fearing ridicule, astronaut once hid model rockets"
January 28, 1992	"Canadian plants wheat, comrades try space sled"
January 29, 1992	"Canada stars in space shuttle"
February 18, 1992	"Bondar was *like mush* during shuttle mission"

5) *THE GLOBE AND MAIL* - Photocopies of Articles

January 29, 1992	"Astronaut has *the right stuff*"
January 30, 1992	"Bondar prepares for shuttle's fiery return"

6) *ANNA CHAMOT and J. MICHAEL O'MALLEY*

Three color-coded sheets

List of Learning Strategies. From Chamot, A.U. & J.M. O'Malley (1987).
The cognitive academic language learning approach: A bridge to the mainstream.
TESOL Quarterly, 21(2), 247-249.

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Chapter 1

Background Information

Chapter 1

Background Information

Preliminary Note from the Authors:

We want to begin by stressing to you that *the ideas in this introductory chapter are very important.* We hope you read this background information carefully and thoroughly, because the practical examples and teaching suggestions in subsequent chapters can't really be understood without it (especially the information on CALLA).

You won't get very far in this chapter without noticing that almost everything is organized in groups of threes. This pattern began as a coincidence and ended up as a deliberate decision on our part. We like the arrangement because it imposes an orderly structure on the discussion, and also -- more significantly -- because it may help you better to remember some of the ideas below.

1. Introduction: Purpose, Rationale, and Preview.

1.1 Purpose.

The purpose of this manual is to show teachers a new and effective integrated approach for instructing the ESL students in their classrooms. We call it the **Foresee Approach**. The term "Foresee" derives from the homophone **"4C,"** which stands for **C**ommunication, **C**ognitive-Academic Language Development, and **C**ontent Instruction in the **C**lassroom. We are firmly convinced that teachers who adopt this approach as the basis of their instructional planning should be able to foresee great improvements in the abilities of their ESL students to learn academic English and master content-area work.

The Foresee Approach can be used by teachers of two types.

a) **ESL specialist teachers** dealing with "all-ESL" classes or groups of students. Since the teacher's main objective in such situations is usually to teach language by using content-area work as the vehicle of instruction, this scenario is called **content-based LANGUAGE instruction** (Short, Crandall, & Christian, 1989).

b) **Regular classroom teachers** whose classes contain ESL students, whether in small or large proportions. The teacher's main goal in such situations is usually to teach content. If he or she recognizes the value of teaching language through the content-area work, however, and makes special efforts to help ESL students overcome their language difficulties, such instruction is called **language-sensitive CONTENT instruction** (Ibid.).

More than half of this manual is devoted to the description of a number of sample lessons and units. The purpose of these lesson plans and unit plans is to *demonstrate* the general approach we are advocating. All of these lessons and units have been tested in the classroom and have been found to be effective, and there is no reason why they could not be used directly ("as is") by interested teachers. We emphasize, however, that our goal is not to provide an instructional "cookbook" full of recipes that teachers can follow "to the letter." Rather, we aim to introduce teachers to a new way of thinking, a general approach to instruction which will empower them to create *their own* exciting, effective lessons and units for promoting the cognitive and language development of their ESL students. (And as a bonus, it should be noted, such lessons and units can be of great benefit to English-speaking students as well!)

The new approach we shall describe and illustrate is not intended to replace other time-tested methods and techniques for teaching academic language skills to ESL students. We recognize, for example, the value of the Language Experience Approach (LEA) for teaching reading, and the effectiveness of the process approach for teaching writing skills. We will have little to say about these and other useful methods, however, as they are adequately explained in many other publications. The Foresee Approach is meant to be a *supplement* to them, and should be regarded as an "additive" rather than a "subtractive" model of instruction.

One last point: this manual is decidedly oriented towards the elementary level. All the lesson plans and unit plans are intended for students in grades 1-6. Despite this choice of focus, however, the usefulness of our basic approach is not restricted to elementary instruction. Teachers at the secondary level can easily adapt our techniques and procedures to suit older learners as well.

1.2 Rationale

Experienced teachers may wonder why we wish to introduce yet another approach for teaching ESL, when so many methods and procedures (not to mention materials) are already available. The justification for a new approach lies in a radical shift of focus that has occurred in ESL instruction during the last five or six years.

Briefly, TESL methodology in the late 1970's and early 1980's emphasized the acquisition of **communicative competence**. In schools containing sufficient numbers of non-English-speaking students, special ESL classes were set up to promote such acquisition. The goal of what came to be called **communicative language teaching** (CLT) was to develop the functional language proficiency of ESL students through the use of naturalistic, communication-oriented methods and techniques. Putting this more simply, the aim was to teach students the kind of English they would need in order to get along in everyday social situations. The emphasis of instruction consequently shifted away from language "form" (grammar) and towards such matters as language appropriateness ("sociolinguistic competence"), the rules of discourse ("discourse competence"), and -- more generally -- the ability to use language to perform important social functions like greeting, apologizing, agreeing and disagreeing, accepting or refusing invitations, asking for information, etc. After ESL students had experienced enough of this sort of instruction to be able to speak and understand the language of everyday communication, they were considered ready to exit their isolated ESL classes and enter mainstream programs. There, it was assumed, they could progress smoothly into the next stage, learning the conventions of "academic" English and developing the necessary language and literacy skills to succeed in content-area work.

Unfortunately, this scheme didn't work very well. It turned out that the acquisition of communicative competence was no guarantee of success in regular coursework. The main reason for this, as the research of Jim Cummins made clear in the early 1980's (see Section 2.2.2) was that there are significant differences between everyday conversational language and the language used in academic work. The English that ESL students had learned in order to perform "communicative" functions like greeting, apologizing, and accepting invitations was not of much use when it came to reading content-area textbooks or writing essays in mainstream courses. Some of the major differences between "communicative English" and "academic English" will be explained later in this chapter, especially in Section 2.2.2. For the moment, let us be satisfied with the observation that the task of teaching ESL must include an instructional component devoted to academic language. And since academic language obviously can't be taught in a vacuum, a movement began during the mid-1980's towards teaching English through content-area subjects -- science, social studies, mathematics, and so forth. This general approach is usually referred to as **integrating language and content instruction**. For good reviews of the topic, see Spanos (1990) and Snow (1991). More detailed but individualistic treatments can be found in Mohan (1986), Crandall (1987), Cantoni-Harvey (1987), Short, Crandall, & Christian (1989), and Brinton, Snow, & Wesche (1989).

How did this shift of focus transform the existing pattern of ESL instruction, described above? Although the details of implementation varied from school to school, new and revised ESL programs began to feature some degree of *academic* language training as a supplement to communicative language training. This trend continues to the present. For example, in schools containing enough ESL students to make separate ESL classes feasible, especially at the secondary level, the instructional sequence often looks something like this:

Stage 1. Preparatory ESL instruction -- isolated beginner-level ESL classes concentrating on communicative language training.

Stage 2. Transition or "bridge" courses -- special ESL classes designed to prepare intermediate and advanced-level ESL students for mainstream coursework; focus on academic language training.

Stage 3. Mainstream courses (science, social studies, mathematics, language arts, etc.)

In secondary schools which contain too few ESL students to form separate ESL classes, and in most elementary schools, the *pullout model* is generally used instead. ESL students are assigned to regular classes from the outset, even though they may speak no English at all. ESL resource or "support" teachers then "pull out" single students or small groups of students for a certain amount of time per day, with the goal of teaching them (a) communicative English, and subsequently (b) academic English. While such special training is important, it goes without saying that these children should receive as much help and encouragement as possible in learning English within the regular classroom setting as well.

The modern trend described above places new demands on teachers. ESL teachers who have previously developed expertise in teaching communicative language skills must now add to their repertoires a set of effective methods and techniques for teaching academic language as well. Regular classroom teachers must recognize their responsibility for promoting their ESL students' academic language growth, and must learn productive ways of accomplishing this goal. This manual was written to meet these needs. The Foresee Approach provides a model that both ESL and mainstream teachers can use to plan appropriate instruction for developing their ESL students' academic language proficiency.

1.3 Preview

This first chapter is intended as an introduction to the Foresee Approach, and focuses mainly on theoretical concerns. Section 2 reviews some important theoretical (and also, in some cases, practical) developments in a variety of fields, all of which combine to provide our approach with a solid foundation. Section 3 presents a detailed summary of the Cognitive Academic Language Learning Approach, or CALLA, invented by Chamot and O'Malley (1986, 1987, 1989). Their model is revised here into an original form which serves as the **theoretical** constituent of the Foresee Approach.

Following Chapter 1, the focus of this manual shifts to more practical matters, and subsequent chapters all deal in some way or other with the **application** of the Foresee Approach in real classrooms. Chapter 2 discusses the importance of good **materials** in developing effective Foresee lessons and units. Chapter 3 provides some specific guidelines for **planning** these lessons and units, and also outlines some effective **techniques** that can be exploited for this purpose. Chapters 4, 5, and 6 all contain descriptions of individual foresee units, each chapter consisting of a sequence of detailed lesson plans. The sourcebook concludes with a short Chapter 7, which contains a number of practical suggestions of a more general nature for integrating ESL students into the regular classroom.

2. Foundations: Language Acquisition, Psychology, and Education.

2.1 Overview.

The general movement towards integrating language and content has been pushed forward by theoretical and practical developments in a number of diverse fields. Some of the most important of these developments or "foundations" are briefly discussed in this section, one by one. Their significance to the Foresee Approach will be noted at the end of each subsection.

The developments selected for consideration fall into three categories, represented by the circles in Fig. 1.1. Each circle contains three subcategories, giving a total of nine underlying foundations.

2.2 Language Acquisition Foundations

2.2.1 Krashen

The language acquisition theory of **Stephen Krashen** (1982) has had an enormous influence on second language teaching practices over the past dozen years or so. Krashen's theory itself pertains mainly to the acquisition of the "linguistic rules" of a language (sentence structures, verb tenses, etc.). Nevertheless, his theory encourages a particular methodological orientation which has major consequences for both communicative language teaching (CLT) and integrated language and content instruction.

Krashen argues that there are two distinct ways of gaining knowledge of a language, *acquisition* and *learning*. **Acquisition** is the process of internalizing the vocabulary and rules of a language subconsciously, without apparent effort, the way young children pick up their first

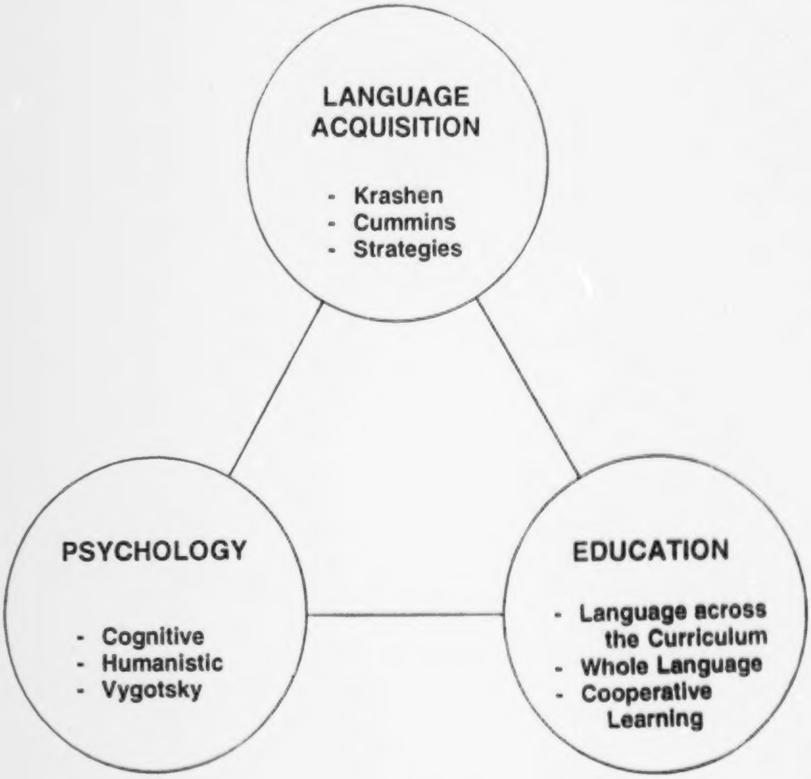

LANGUAGE ACQUISITION
- Krashen
- Cummins
- Strategies
PSYCHOLOGY
- Cognitive
- Humanistic
- Vygotsky
EDUCATION
- Language across the Curriculum
- Whole Language
- Cooperative Learning

Fig. 1.1: Foundations of Integrated Instruction

language (L1). **Learning** is the planned, conscious study of language, usually involving a great deal of memorization and deliberate practice. The latter is, of course, the route typically followed by adult learners of a second language (L2). Acquired language rules are subconscious and implicit ("in your head"), whereas learned rules are conscious, explicit, and mentally accessible for analysis and description. Krashen claims that acquisition and learning are two completely *separate* processes, and that learning can never result in acquisition. The main value of learned rules, he insists, is that they can serve a "monitor" function, providing L2 speakers with conscious knowledge that they can use for editing or correcting utterances. Acquired linguistic knowledge, such as the rules of our L1, cannot result from "learning" in Krashen's sense, or so he claims.

How, then, *does* it result? How can students "acquire" a second language? According to Krashen, L2 acquisition closely resembles L1 acquisition. Despite the popular opinion that the ability to acquire languages in a natural way declines after childhood, older learners can actually "pick up" language as children do. That is, they can make subconscious use of their innately-endowed "language acquisition device" (LAD) to acquire the rules of a language, and this process can be automatic and relatively effortless. All that it requires, Krashen maintains, is a rich, appropriate, and plentiful supply of **comprehensible input**. If learners are exposed to a sufficient quantity of linguistic messages that they can *understand*, and if they focus on the *meaning* (not the *form*) of those messages, and if they have a *positive attitude and motivation* towards receiving the messages, then *acquisition will inevitably occur*. The LAD functions automatically, allowing learners to acquire the rules and structures of the L2 in a definite sequence or "natural order." In a nutshell, this is Krashen's theory of L2 acquisition.

Its instructional implications are straightforward. The proper way to teach a second language, Krashen argues, is to provide students with a plentiful supply of good comprehensible input in a comfortable, motivating learning environment. If this is accomplished successfully, acquisition will take care of itself -- effortlessly, automatically, and naturally. This sounds too good to be true. The trick, of course, is for the teacher to provide the right input. One of the keys to doing this effectively is to give students plenty of contextual clues to meaning -- pictures, physical objects, body language, etc. This strategy is the basis of Krashen and Terrell's (1983) **Natural Approach** for teaching second languages. It is easy to see why the main procedures of this approach -- and Krashen's ideas more generally -- have had such an impact on communicative language teaching. No longer do L2 teachers consider it imperative or even advisable to encourage the formal, conscious study and learning of vocabulary and grammar. Acquisition is now regarded by many as the correct route to communicative competence, and instruction tends to reflect this priority.

Krashen's theory is also cited, quite often, in support of the practice of integrating language and content, mainly on the grounds that the various content areas are a rich and almost limitless source of interesting and motivating comprehensible input. This is certainly true, and we recommend that both ESL and mainstream teachers take advantage of the potential of content-area work to promote language acquisition. Nevertheless, we caution strongly against the supposition that the conventions, rules, and skills of academic language can be automatically "acquired" in the way that Krashen suggests. Teachers should not assume that ESL students will somehow absorb academic language through mere exposure to it. Young children, after all, acquire most of the structures of their L1 before beginning school, but they still have to *learn* how to read and write. In our opinion, many of the facts and skills of academic language have to be learned (on a conscious level) by L2 students as well. While the Foresee Approach encourages acquisition-oriented activities in the classroom, then, it also insists on the need for deliberate, planned instruction of a number of important aspects of language and, obviously, content as well. We shall return to this issue below.

2.2.2 Cummins

Probably no single researcher has had more of an influence on the movement towards integrated instruction than Jim Cummins. His first major contribution (1979) was his suggestion that there were important differences between **basic personal communicative skills** (BICS) and **cognitive/academic language proficiency** (CALP), a distinction already alluded to above. When he coined these terms, the emphasis of ESL instruction was primarily on BICS, what we have called "communicative competence." The idea that CALP entails a different sort of competence was really the starting point of the current trend towards integrating language and content. Unfortunately, Cummins did not initially define the differences between BICS and CALP in any substantive way, and the two terms aroused a good deal of controversy in the literature. He subsequently abandoned them in favor of a more rigorous way of characterizing the difference between communicative and academic language proficiency.

This newer scheme (Cummins, 1983) contrasted the two kinds of proficiency in terms of two independent criteria, *cognitive demand* and *context embeddedness*. A first and rather obvious difference between communicative and academic language tasks is that the latter are more difficult, more mentally challenging. Delivering a formal speech or writing an academic essay, for example, are far more **cognitively demanding** than chatting over coffee or writing a friendly letter.

The second difference concerns the degree to which language is supported by contextual information of various sorts. Conversational language tasks are generally easy to perform because they are **context embedded** -> that is, speakers or listeners can make use of many cues *besides language* in producing and interpreting messages. These include stress and intonation patterns in speech, gestures, facial expressions, and visual supports of various kinds (the physical surroundings, objects that both speaker and listener can see and touch, sometimes pictures or diagrams, etc.). Another attribute of contextual support is the frequent opportunity of negotiating meaning as a conversation progresses: the participants can repeat themselves, rephrase their thoughts, ask for clarification, exercise control over the topic under discussion, and so forth. In contrast, these various contextual supports are far less common in academic language, which tends to be **context reduced**. Needless to say, language tasks are more difficult for students when extra-linguistic cues are unavailable and meanings are encoded exclusively in the words themselves.

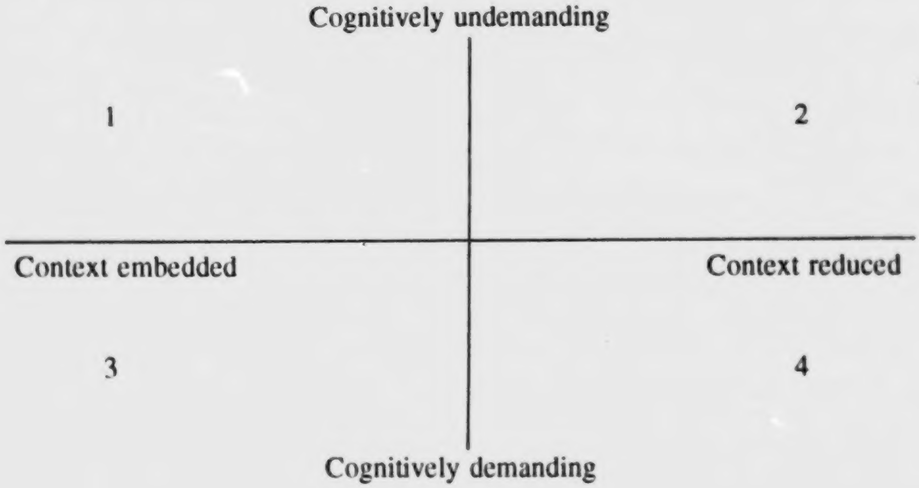


Fig. 1.2: Two Dimensions of Language Proficiency

Since cognitive demand and context embeddedness are independent criteria, language task difficulty can vary along two dimensions, as shown in Fig. 1.2 (Cummins, 1983). The language of everyday communication is cognitively undemanding and context embedded, so Cummins's "BICS" falls into quadrant 1. Academic language tends to be the opposite, cognitively demanding and context reduced, and thus lies in quadrant 4.

Considering all this from an instructional perspective, the first thing that should be obvious is that leaping directly from quadrant 1 to quadrant 4 will surely be difficult for most ESL students. This explains why the former scheme of teaching BICS first, CALP second is ineffective. The preferred alternative is to lead students through transitional stages along the way to academic proficiency. Such stages are represented by quadrants 2 and 3 in the diagram. In quadrant 2, language tasks are context reduced but within students' abilities because they are cognitively undemanding. In quadrant 3, the potential domain of much successful content-area instruction, difficult material is made comprehensible via deliberate, carefully planned contextual support -- pictures, diagrams, realia, videotapes, etc. At this point Cummins's theory intersects with Krashen's, both emphasizing the value of context in making input comprehensible. The Foresee Approach operates mainly in the realm of quadrant 3.

2.2.3 Strategies

The middle and late 1970's witnessed a sudden growth of interest in **language learning strategies**. Researchers were motivated by the conviction that "good language learners" were able to acquire second languages successfully because they knew how to make use of effective strategies for memorizing L2 items, analyzing and making sense of the structures of the L2, creating opportunities for worthwhile practice, etc. The thrust of research was to discover, through observation, student introspection, and a variety of other methods, just what these effective strategies were, and to classify them. Rubin (1975, 1981) identified a relatively small number of useful strategies, including monitoring (of self and others' speech), systematic memorization, and inductive inferencing (guessing meanings from context). Naiman *et al* (1978) listed five major categories of good L2 learning strategies, namely (1) taking a positive, active approach to the task, (2) approaching the L2 as a system and constantly analyzing that system, (3) using language for communicative purposes, (4) coping with the affective demands of L2 learning, and (5) constantly monitoring one's L2 performance.

This interest in strategies continued into the 1980's with the work of Oxford (e.g., 1985, 1990). Her classification scheme is the most complex of all, as she distinguishes between "direct" strategies (3 types -- *memory*, *cognitive*, and *compensation*) and "indirect" strategies (3 types -- *metacognitive*, *affective*, and *social*). These 6 main categories include 19 subcategories in all, which in turn encompass no fewer than 62 specific learning strategies. One notable merit of Oxford's (1990) detailed book on the topic is that it presents a wide variety of useful exercises and activities for teaching these many strategies to L2 students.

This interest in language learning strategies was paralleled by a growing interest in the nature and function of cognitive strategies for learning in general (e.g., Weinstein & Mayer, 1986; Weinstein, 1988; Mayer, 1988). Researchers have made considerable progress in discovering and classifying a variety of mental strategies which students can learn to apply to their learning tasks in order to accelerate the acquisition of academic knowledge and skills. The need for shifting emphasis from the "what" of learning (i.e., the subject area content) to the "how" is eloquently expressed in the following passage from Norman (1980).

> It is strange that we expect students to learn yet seldom teach them about learning. We expect students to solve problems yet seldom teach them about problem solving. And, similarly, we sometimes require students to remember a considerable body of material yet seldom teach them the art of memory. It is time we made up for this lack, time that we developed the applied disciplines of learning and problem solving and memory. We need to develop the general principles of how to learn, how to remember, how to solve problems, and then to develop applied courses, and then to establish the place of these methods in an academic curriculum. (p. 97)

For a thorough and easily accessible review of the research in the teaching of learning strategies, the reader is advised to consult Weinstein and Mayer (1986).

Chamot and O'Malley (1986, 1987, 1989; O'Malley & Chamot, 1990) have drawn heavily upon research in both types of learning stategies (language and general cognitive) in formulating their Cognitive Academic Language Learning Approach (CALLA). We shall postpone our discussion of their classification scheme until Section 3.3.3. The CALLA model of integrated instruction is the main foundation of the Foresee Approach, and its **learning strategies component** will therefore be examined in considerable depth.

2.3 Psychological Foundations

2.3.1 Cognitive Psychology

Modern L2 teaching practices, whether communication- or content-oriented, have been heavily influenced by the principles of **cognitive psychology** (e.g., Ausubel, 1968; Anderson, 1985; see Chastain, 1976, for an excellent discussion). Although an extensive review of this topic is impossible here, we shall briefly mention three cognitive principles that have special significance for integrated instruction.

First, learners are *active* processors of information. Little credibility now resides in the behavioristic view that students should be treated as passive receptacles into which knowledge can be poured little by little, with learning resulting as a conditioning process. Modern integrated L2 teaching emphasizes the learner's active involvement with the material to be assimilated, both the language and the content. Activities like drill, mechanical practice (written or oral), and rote memorization are to be avoided in the classroom in favor of more stimulating and creative learning tasks. As mentioned above, an important focus of academic instruction should be the development of appropriate **learning strategies**, i.e., mental processes for facilitating the acquisition of knowledge and skills. The Foresee Approach, like CALLA, emphasizes the instruction of such strategies.

Second, learning is facilitated -- indeed, is only possible -- when students are able to fit the new information they encounter into their *existing knowledge frameworks.* Good teachers therefore make special efforts to activate learners' "schema" or background knowledge as a first step in introducing any topic. Lesson design in both the Foresee Approach and CALLA includes a **presentation phase** which is intended for this purpose.

Third, there are two basic avenues to understanding written or spoken language. Comprehending new material by bringing to bear one's prior knowledge is known as "*top-down*" processing, while comprehension based on the careful decoding of linguistic messages (vocabulary, structures, and style) is called "*bottom-up*" processing (Carrell, 1983). Good teaching methods, such as those promoted by the Foresee Approach, activate both avenues to understanding. Both are important.

2.3.2 Humanistic Psychology

Little space needs to be devoted to this topic, since its basic ideas are relatively obvious. As emphasized in the work of psychologists like Carl Rogers (1956) and Abraham Maslow (1971), and also in the writings of language teaching practitioners like Gertrude Moskowitz (1978), instruction is most effective when it appeals to, and satisfies, the emotional (affective) needs of learners. Moskowitz expresses this view very poignantly:

> Affective education is effective education. It works on increasing skills in developing and maintaining good relationships, showing concern and support for others, and receiving these as well. It is a special type of interaction in itself, consisting of sharing, caring, acceptance, and sensitivity. It facilitates understanding, genuineness, rapport, and interdependence. Humanistic education is a way of relating that emphasizes self-discovery, introspection, self-esteem, and getting in touch with the strengths and positive qualities of ourselves and others. (p. 14)

The result of such education will be *self-actualization*, and

> since self-actualization is such a powerful inherent need in humans, as students see the subject matter as self-enhancing, it will be viewed as relevantly related to their lives. They will then become more motivated to learn . . . (p. 13).

Although integrated instruction does not normally include the sorts of humanistic language-learning activities advocated by Moskowitz (1978), the Foresee Approach certainly promotes all of these values. We believe that teachers should never underestimate the learning potential of children. Given instruction, encouragement, and guidance that enhances their sense of self-worth, they are capable of amazing achievements. Perhaps the greatest strength of the Foresee Approach is that it equips the teacher with a way of *setting the students up for success*. We have found that when this is accomplished, success tends to follow almost invariably.

2.3.3 Vygotsky

The great Russian psychologist **L.S. Vygotsky** died in 1934, but his ideas about cognition and learning have recently begun to gain the influence they deserve. We shall outline two of his key concepts, attempting briefly to relate them to the theory and practice of integrated instruction.

One of Vygotsky's major insights about learning was that "mental functioning occurs first between people in social interaction and then within the child on the psychological plane" (Rogoff & Wertsch, 1984). Thinking, reasoning, and problem solving are initially carried out on the *interpsychological* plane, as collaborative endeavors involving several participants (e.g., parent and child, teacher and child). This becomes the basis for these processes to be internalized by the child, at which point they become integrated into (and in fact help create) the *intrapsychological* plane.

Vygotsky's second key concept relates to the dynamics of this developmental process, specifically, how individuals proceed from lower stages of psychological functioning to higher stages. To explain this, Vygotsky proposed a construct which he called the **zone of proximal development** (ZPD). He argued that it is simplistic to define children's developmental levels only in terms of what they can do on their own (as, for example, on written intelligence tests). Any child can reasonably be regarded as having two levels of development:

a) the level of individual, independent functioning, i.e., the level of actual development; and

b) the level at which the child can function "while participating in instructional social interaction" (Rogoff & Wertsch, 1984), i.e., the level of *potential development*.

Vygotsky defined the zone of proximal development as

> the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined by problem solving under adult guidance or in collaboration with more capable peers (Vygotsky, 1978).

In contrast to Piaget, who maintained that instruction should be appropriate to developmental stages that have already been completed, Vygotsky argued that

> instruction is good only when it proceeds ahead of development. It then awakens and rouses to life those functions which are in a stage of maturing, which lie in the zone of proximal development. It is in this way that instruction plays an extremely important role in development (Vygotsky, 1956).

Vygotsky's theory underlies a number of recent pedagogical notions. One of the best known is the concept of **scaffolding** (Wood, Bruner, & Ross, 1976). A teacher using this technique "monitors the child's current level of skill and supports or 'scaffolds' the child's extension of current skills and knowledge to a higher level of competence" (Rogoff & Gardener, 1984). A second related notion is Tharp and Gallimore's (1988) conception of teaching as **assisted performance**: "teaching can be said to occur when assistance is offered at points in the ZPD at which performance requires assistance" (p. 41).

We have placed considerable emphasis on Vygotsky's theories because we believe Tharp and Gallimore's definition of teaching to be a profoundly insightful one. ESL students have to be assisted through two different, though related, zones of proximal development: the language zone and the content zone. They will not find it easy to traverse either zone without expert guidance from the teacher, whose role in the classroom obviously transcends that of being a mere facilitator of interesting activities. Good teaching, we affirm, demands both skill at estimating each student's ZPD and expertise in providing instruction that will foster the internalization of social experiences. The Foresee Approach thus recognizes an important place for what Chamot and O'Malley (1989) call "teacher-directed" activities, which are essential if students are to receive proper assistance through their ZPD's. We shall return to this matter below in our discussion of the whole language approach (Section 2.4.2).

2.4 Educational Foundations

2.4.1 Language across the Curriculum

Like the other two modern movements to be discussed in this section, whole language and cooperative learning, the **language across the curriculum** movement is an approach for *first language* (L1) education that has been adapted for L2 instructional purposes. In fact, this movement is really the genesis of the current trend towards integrating language and content, its main tenet being -- as the name suggests -- the idea of teaching language skills through all the subjects in the curriculum.

The language across the curriculum movement was triggered originally by the Bullock Report in Great Britain, entitled *A Language for Life* (1975). One key observation of the Bullock

Commission was that a child, in growing from 0 to 5 years of age, (a) accomplishes an incredibly complex task in learning its L1, and (b) learns more about its environment than in any subsequent 5-year span. For the young child, personal, cognitive growth and language growth proceed in concert. Language is the "means" and personal growth is the "end," in the Report's terms. The two are "interlocking" from age 0 to 5. But this interlocking, the Report insists, should be continued when school begins, not replaced by an approach that fractures and separates language learning from content learning.

> What we advocate here is no more than that this interlocking of the means and the ends should be maintained ... throughout the years of schooling. To achieve this we must convince the teacher of history or of science, for example, that he (sic) has to understand the process by which his pupils take possession of the historical or scientific information that is offered them; and that such an understanding involves his paying attention to the part *language* plays in *learning*.

Obviously, this insight directly underlies and supports the current trend towards integrated L2 instruction, including the Foresee Approach.

A second important insight advanced in the Bullock Report was that each school subject (science, social studies, mathematics, etc.) entails its own special, unique variety of academic language.

> In general, a curriculum subject, philosophically speaking, is a distinctive mode of analysis. While many teachers recognize that their aim is to initiate a student in a particular mode of analysis, they rarely recognize the linguistic implications of doing so.

The Bullock Commission was mainly concerned about developing the abilities of students to handle the differing *first* language academic demands of various curriculum subjects. The need for such specialized language instruction is even more acute when students are attempting to cope with curricular demands in a *second* language. All teachers of ESL students, whether in ESL or mainstream classrooms, should be aware of the unique linguistic demands of each subject area that their students have to deal with. (See Gillham, 1986 for a number of insightful articles on this topic.) The Foresee Approach, as we shall see, provides explicit guidelines for identifying these special linguistic features and for teaching them through content-area work.

2.4.2 The Whole Language Approach

A second L1 teaching movement with obvious consequences for integrated ESL instruction is the **whole language approach**, which one supporter describes as no less than "a *philosophy*, a belief system about the nature of learning and how it can be fostered in classrooms and schools" (Weaver, 1990). The burgeoning popularity of this movement in recent years has been confined mainly to the elementary level, though whole language methods can certainly be applied at the secondary level as well (see, e.g., Gilles *et al*, 1988). An excellent guide to using the whole language approach specifically for ESL instruction at the elementary level is Enright & McCloskey (1988).

While we lack the space here to present a thorough description of whole language, we believe the essence of the approach is captured in the following four principles.

a) Whole language instruction is **holistic**, featuring **integration** of all the language skills (listening, speaking, reading, and writing) as well as integration of language with content-area work.

b) Both oral and written language must be **functional** and **authentic** in the whole language classroom, fulfilling real purposes for language users, expressing personal meanings, etc.

c) Whole language instruction encourages considerable **student control** over the content of learning. To a large degree, the curriculum is "negotiated" with children, i.e., "it evolves as teachers and children together explore topics and themes, generating new interests and goals" (Weaver, 1990). Note, however, that whole language teachers are expected to ensure that the mandated curriculum is somehow incorporated into the "negotiated" one.

d) Learning activities in a whole language environment involve a great deal of interaction (student-student, student-teacher), collaboration, and communication. Weaver (1990) asserts that whole language instruction is based on a **transactional** model of learning, "reflecting the fact that the learner actively engages with -- or transacts with -- the external environment, including people and books, in order to learn."

We heartily endorse these principles, and recommend them as important guidelines for Foresee instruction. The first is, of course, at the heart of the Foresee Approach. As for the others, we agree with the proponents of whole language that learning is enhanced when language is used for real purposes, when students have some ownership over the curriculum, and when classroom activities are collaborative and "transactional."

Despite these obvious merits, however, we caution against the wholesale adoption of whole language as the *sole* basis of integrated ESL instruction. In our view, the whole language approach places too great a reliance on "inner-directed" learning. Advocates of whole language generally assume, and often state explicitly (e.g., Goodman & Goodman, 1990), that successful learning depends mainly on the *child's* contribution to the process -- interest, motivation, personal sense of purpose, autonomy, creativity, and so forth. This assumption is implicit in Weaver's interpretation of "transaction" in principle (d) above. She views transaction as basically a one-way process, the child's active engagement with the external environment. There is no mention here of the environment's active engagement with the child. This betrays a general lack of interest -- typical of the proponents of whole language -- towards the organization of maximally effective environmental support. A simpler name for the latter is "good teaching."

In our opinion, good teaching means more than acting as a facilitator of children's learning and working to foster an atmosphere of independent inquiry, important though these responsibilities may be. Good teaching also involves the ability to assess what students know and are able to do on their own, to estimate what they could know and could do with proper pedagogical guidance, and to assist them to traverse the gap -- this being, of course, Vygotsky's zone of proximal development. While much knowledge and many skills of language and content-area work can doubtless be "acquired" through experiential learning of the whole language variety, there are many things that students cannot learn efficiently and successfully without the teacher's help.

We realize that we can be accused of exaggeration here. Whole language teaching, its supporters will insist, does not exclude teacher-centred instruction; skilled whole language teachers are able to draw upon a wide repertoire of different instructional styles, teacher-centred ones included, to meet the varied needs of their students. This is true, no doubt, but unfortunately, not all teachers possess the necessary expertise to do this. We fear that the whole language environments of many students will turn out to be aimless and disorganized unless teachers are provided with clear-cut guidelines for incorporating appropriate teacher-centred instruction into their lessons. The Foresee Approach contains specific guidelines of this sort, allowing teachers a systematic way of effectively blending together what Chamot and O'Malley (1989) call "teacher-directed" and "learner-centred" instructional procedures.

2.4.3 Cooperative Learning

During the mid-1980's, increasing attention began to be paid to the instructional advantages of **cooperative learning** (e.g., Slavin, 1983; Johnson *et al*, 1984; Kagan, 1985, 1986). Although most research on the topic has dealt with the English L1 (i.e., mainstream) context, Jacob and Mattson (1987) suggest that cooperative learning methods can also contribute to the academic development of ESL students. Obviously, such arrangements provide opportunities for a great deal of personal interaction among students. In mainstream classrooms, the increased communication between ESL and English-speaking students is likely to help the ESL students to improve their communicative competence (McGroarty, 1992). More significantly from our perspective, their *academic* language proficiency -- especially their oral proficiency -- is bound to be promoted by such communication, since a good deal of it will involve the performance of content-area tasks. Jacob and Mattson maintain that cooperative learning methods can be used with all ESL students and with any type of class:

> The methods are helpful with students from kindergarten through college at all levels of proficiency, in ESL pullout classes, sheltered English classes, or mainstream classes. Subjects can include English as a second language or content areas such as math, science, and social studies (1987).

Cooperative learning means more than putting students in small groups and having them work together. A number of different cooperative learning methods have been proposed in the literature on the topic. These differ from each other in a number of ways, including the aspects of development promoted, the type of cooperation required, student roles, and teacher roles. Perhaps the best known of these methods -- at least among ESL teachers -- is the **Jigsaw** technique, which has been adapted for L2 instructional purposes by Coelho (1988). Still, some of the other specific methods reviewed by Jacob and Mattson (1987) would also seem to have promise for the teaching of ESL students, though they might require a certain amount of modification. Kagan (1990) observes that cooperative learning methods, or **structures** as he calls them, are "content-free ways of organizing social interaction in the classroom." When utilized or applied for particular purposes in content-area lessons, structures give rise to specific *activities*. The advantage of knowing a variety of cooperative learning structures, such as those listed by Kagan (1990), is that they can be used to generate literally an unlimited number of classroom activities.

It is no exaggeration to say that cooperative learning of some kind should take place in *every* Foresee lesson. Oral academic language skills are not developed in silent isolation. They stand a good chance of growing, however, when ESL students collaborate with each other or with English-speaking peers to accomplish meaningful content-related tasks.

3. The CALLA Model

3.1 Introduction to CALLA

The **Cognitive Academic Language Learning Approach**, or **CALLA** (pronounced caLLA), is the invention of Anna Uhl Chamot and J. Michael O'Malley, two innovative researchers and educational theorists at Georgetown University in Virginia. Their model is explained at length in a number of their writings, especially Chamot & O'Malley (1986, 1987, 1989) and O'Malley & Chamot (1990). Readers wishing to deepen their understanding of CALLA, especially the details of its theoretical foundations in cognitive psychology, are advised to consult some of these sources.

We have modified CALLA slightly and adopted it as the backbone of the Foresee Approach. Were it not for the few minor changes we have made, it would be fair to say that the lesson plans and unit plans in this manual are simply good examples of the CALLA model itself. At the very least, they are certainly "CALLA-based." Since CALLA is a copyrighted term belonging to Chamot and O'Malley, we have chosen a different name for our instructional model, namely the "Foresee Approach." We must emphasize, however, that a thorough understanding of CALLA is *absolutely essential* to the appreciation of the teaching methods and techniques outlined in later chapters. Our objective in this section is to explain this important model in sufficient detail that the reader will be able to perceive its application in the practical examples to follow. The reader should be aware that the description of CALLA presented below incorporates the various modifications we have made. In other words, this is *our* version of the model, not -- strictly speaking -- Chamot and O'Malley's.

3.2 The Basic Framework of CALLA

CALLA is a model of integrated instruction. Most other models of this type emphasize the integration of two domains of knowledge, content and language. CALLA goes beyond them in advocating the integration of *three* domains: content, language, and learning strategies. A typical CALLA lesson contains three components, as illustrated in Fig. 1.3 on the next page.

These three components are not taught separately, in isolation from each other. Rather, they interact with each other in reciprocal and mutually supportive ways, as indicated by the two-way arrows in Fig. 1.3. The two components at the bottom, language and learning strategies, serve as the "base" for the learning of content (subject matter). Conversely, the content material provides the vehicle through which academic language proficiency can be developed and the

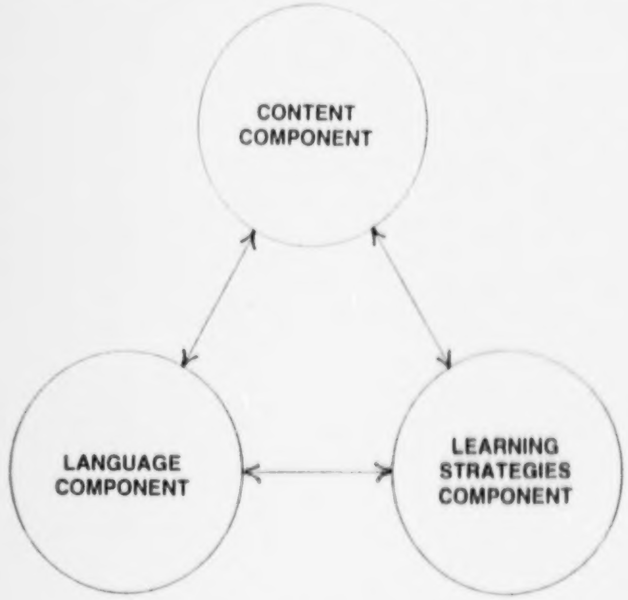


Fig. 1.3: The CALLA Model

learning strategies can be learned and practised. In fact, it is fair to say that CALLA instruction is "content-driven," since the choice of content generally determines which aspects of language and which learning strategies will be taught; hence, the position of content at the top of the triangle is appropriate. As for the interaction between the two base components, well-chosen learning strategies can assist students to acquire language (knowledge and skills), while language skills are essential to the successful application of the learning strategies. As an example of the latter, good listening skills are obviously important to effective notetaking, one of the cognitive strategies listed by Chamot and O'Malley (see Section 3.3.3).

Our next step in explicating CALLA will be to examine each of these three main components separately, one by one. Our interpretation of the model at this point is somewhat original, as we visualize each component as containing three subcomponents which can be represented by diagrams congruent to that in Fig. 1.3.

3.3 The Three Components of CALLA

3.3.1 The Content Component

The selection of content material to be taught depends on a number of factors, including the students' interests, the teacher's imagination, the curriculum, and the teaching context. Let us focus on the last of these. Obviously, specialist ESL teachers wishing to implement **content-based LANGUAGE instruction** have a good deal of latitude in selecting content topics for their classrooms, as they usually have no prescribed curriculum to follow. Although student interest is certainly a major criterion for deciding on what to teach in such a context, ESL teachers are advised to choose topics that will prepare their students for regular subject-area work when they finally encounter it. Active collaboration between ESL and mainstream teachers can lead to fruitful decisions in this regard (Short, Crandall, & Christian, 1989; Snow, Met, & Genesee, 1989).

Regular classroom teachers face a more difficult problem, that of communicating complex ideas to ESL students who are not yet fully prepared for content-area work. Chamot and O'Malley (1989) observe that mainstream teachers often react to the limited English proficiency of their ESL students by teaching content on an adjusted or simplified level, tolerating lower-order academic and cognitive skills in place of the more advanced skills they expect from their English L1 students. But as Chamot and O'Malley insist, this is a fundamental error. In their words, "ESL students need to learn content that is appropriate to their developmental level and prior educational experience, and higher-level thinking skills are as much to be expected from them as from any student" (1989: 114). Content-area teachers who must cope daily with ESL students from apparently poor academic backgrounds may protest that there seems little else they can do with these students but lower their expectations as a way of getting them through. This reaction is understandable; there is no question that many of our ESL students are lacking in some of the basic knowledge and skills essential for success in mainstream courses. Their previous educational experiences, for whatever reasons, have not equipped them adequately for our curricula. Nevertheless, content teachers should realize that watering down the subject matter and lowering expectations cannot solve the problem. Such measures simply postpone the day, if it ever comes, when these students catch up to their English-speaking peers in academic proficiency.

Turning directly to the internal composition of the content component, we suggest that content mastery generally involves knowledge of three sorts, as depicted in Fig. 1.4.

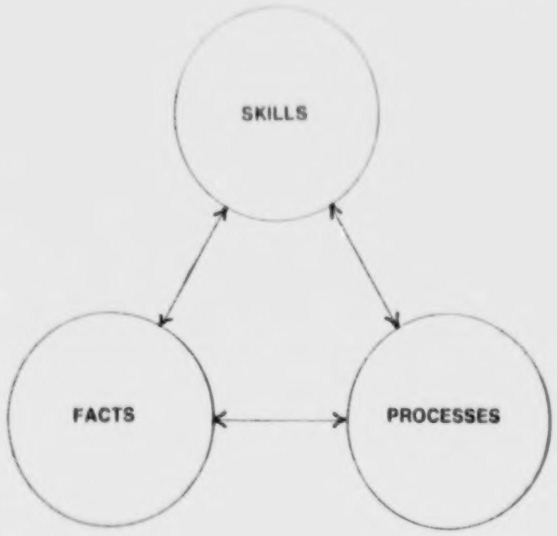


Fig. 1.4: The Content Component

Facts are chunks of information about a given subject area, for example, names, dates, places, and events in history. **Processes** are relations or connections between entities or events, usually conceived as dynamic models. An example would be the water cycle in science, which consists of a complex sequence of events. Both facts and processes, which we have placed at the base of the triangle in Fig. 1.4, are instances of what Anderson (1985) calls ***declarative knowledge***, what we "know" about a given topic. The **skills** represented by the topmost circle are particular modes of analysis, reflection, activity, etc. which one learns through participation in individual subject areas. The most obvious examples of content-specific skills are those of mathematics -- computational skills, algebraic skills, etc. Each subject area contains its own unique set of skills, although some -- like problem-solving skills -- obviously cross disciplines. Skills are instances of *procedural knowledge* (Anderson, 1985), that is, what we know how to *do* in a given subject.

We emphasize that these aspects of declarative and procedural knowledge are to be understood here as strictly *content-related*. Students learn the facts, processes, and skills of science, for instance, by studying and "doing" science. Obviously, language is crucial to all three elements. In learning the facts of science, students must learn appropriate vocabulary. In describing processes, they must use the proper terms and sentence patterns for expressing sequence, cause and effect, etc. In writing experiment reports (a "skill"), they must use the passive voice. The examples are endless, because *content and language are inextricably related.* Nevertheless, the language component is best examined in isolation. Let us do so now.

3.3.2 The Language Component

The purpose of the language component is to give students practice in using English as a tool for learning academic subject matter. Teachers can promote academic language proficiency in two ways, (a) by providing *explicit language instruction* when necessary, and (b) by taking care to build valuable *language experiences* into content-area work. One difference between our Foresee Approach and CALLA is that we assign greater importance to the first of these than Chamot and O'Malley do. Their writings contain little information about explicit language teaching, emphasizing instead the "experiential" route to academic language learning. The purpose of the language development component of CALLA, they state, is to give students

> sufficient practice in using language in academic contexts so that language comprehension and production become automatic and students develop the ability to communicate about academic subjects (1987: 234).

While we agree that participation in content-area activities is of great benefit in developing students' academic language skills, we believe that explicit instruction is often necessary to make students aware of many of the special features of academic language -- grammatical structures, discourse markers, functions, etc.

Another difference between the Foresee Approach and CALLA is the organization of the language component. Chamot and O'Malley (e.g., 1986, 1987) identify four "aspects of language" to be included in this component: *vocabulary*, academic language *functions*, language *structures and discourse features*, and language *skills*. Since vocabulary, or lexical knowledge, is clearly an aspect of what we may call "linguistic knowledge," as are structures and discourse features, we prefer to lump these three together, as shown in Fig. 1.5.

In our experience, many content-area teachers tend to have trouble grasping the meaning of several aspects of this component, especially structures, discourse features, and functions. There is no shame in this, as a full understanding of these matters generally requires a certain familiarity with the field of linguistics, which most teachers lack. We hope the following brief explanations succeed in clarifying these aspects to a satisfactory degree, but we make no pretense

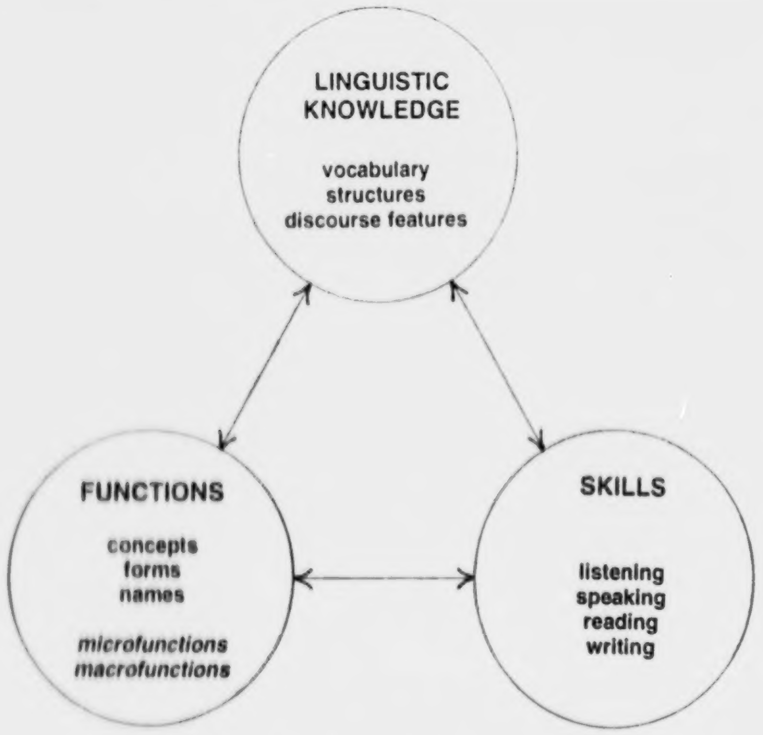

LINGUISTIC KNOWLEDGE
vocabulary
structures
discourse features
FUNCTIONS
concepts
forms
names
microfunctions
macrofunctions
SKILLS
listening
speaking
reading
writing

Fig. 1.5: The Language Component

at completeness here. With this note of caution, let us now proceed to examine each of the three subcomponents represented by the circles in Fig. 1.5.

(1) Linguistic Knowledge

(a) Vocabulary. All teachers recognize the need to teach students the specialized vocabulary and technical terms of each subject area, usually through explicit procedures. In geography, for example, students must learn the meanings of words like *peninsula, moraine, precipitation*, and so forth. Content vocabulary also includes common everyday words used in special senses. For example, *force* and *energy* have quite specific meanings in physics.

In our opinion, the vocabulary difficulties of ESL students go beyond the "specialized" terms of the content areas. Academic writing tends to contain numerous English words that are unfamiliar to students whose competence is limited more or less to what we have called "communicative" language. Words like *estimate, explanation*, and *approximately*, for example, are not especially common in everyday speech, though they feature prominently in academic language across the content spectrum. Both ESL and mainstream teachers should make a deliberate effort to identify and teach such potentially troublesome words.

There exist many useful techniques for teaching vocabulary, but we cannot go into the question of methodology in the limited space available here. For detailed information, see Seal (1991) and references cited therein. Just one piece of advice will have to suffice here. Teaching a word usually involves more than simply teaching its *meaning*, the usual focus of attention. Other aspects that may need to be explained about a word are its derivational roots (especially prefixes and suffixes), its part of speech (noun, verb, etc.), related derivatives (e.g., *explain - explanation - explanatory*), and potentially confusing "near synonyms" (other words that mean almost -- but not quite -- the same thing). Proper vocabulary teaching includes attention to details such as these.

(b) Structures. The second important aspect of linguistic knowledge is **structures**, or, more precisely, **grammatical structures**. By this we mean grammatical forms like verb tenses, articles, prepositions, relative clauses, sentence patterns, etc. that are commonly used in content areas. A good example is the passive voice, which is used extensively in science to describe processes, report experiments, and so on. Of course, the passive voice is also used in other subject areas, so students could practise its use across the curriculum if enough teachers devoted conscious attention to it.

Most content-area teachers do not consider themselves "language teachers," so they may avoid the responsibility of providing explicit instruction about important structures which their students may encounter. They may, in fact, find difficulty even in recognizing which structures are common in their disciplines. Again, collaboration between ESL specialist teachers and mainstream teachers is invaluable in raising awareness about such matters, and hence in bringing content-area material and tasks into the range of ESL students' capabilities.

(c) Discourse Features. The term "discourse" refers to the organization of language in units greater than the sentence. Although this is a complex topic involving many aspects of language, teachers need be concerned for the most part about only three kinds of discourse features: **rhetorical organization**, **discourse markers**, and **theme-rheme structure**.

Rhetorical organization refers to the way stretches of text larger than the sentence are constructed. The classic example is paragraph structure, often recommended to be "topic sentence - supporting details - concluding sentence." Other examples are textbook organization, the structure of friendly letters and business letters, the format of science experiment reports, and the organization of essays (descriptive, expository, etc.) and narratives. ESL students need to be taught about such important features of academic discourse.

The second important aspect of discourse that teachers might include in content-area instruction is the host of special terms -- sentence connectors, "discourse linkers," and "discourse markers" -- that abound in academic writing. There are literally hundreds of these, most of which are used to achieve **textual cohesion**. Terms like *nevertheless, in spite of, consequently, therefore, in contrast to*, and *on the other hand* are infrequent in everyday communication, so ESL students need to be taught their meanings and their proper grammatical usage. Content-area teachers do not have to conduct extensive research to identify such terms; all they need to do is refer to their textbook, each chapter of which will likely contain dozens of them. It is not surprising that ESL students will have problems with these, but if conscious, deliberate attention is paid to their explanation and practice, the problems will disappear, and students' academic language proficiency will increase dramatically.

A third important aspect of discourse structure is *the organization of information within sentences*. From the point of view of information organization, most sentences consist of two distinct parts:

a) the topic, or what is being talked about. Some linguists call this **the theme** of the sentence. It is followed by

b) the comment, or what is said about the theme. This is often called **the rheme** of the sentence.

For example, consider the following discourse. Mary: "Where's your brother?" Bill: "He's in the shower." In Bill's response, *he* is the theme (what is being talked about), while *is ('s) in the shower* is the rheme (what is said about "he"). Notice that in normal discourse the theme typically consists of "given" information, whereas the rheme is usually "new" information. For simplicity, we call this correspondence **theme-rheme structure** in the lesson plans of Chapters 4, 5, and 6. It is evidenced, for example, in students' answers to written questions like "What is an orbit?" The response would be, "*An orbit* (theme - given information - comes first) *is the path of a planet around the sun* (rheme - new information - follows theme).

(2) Functions

No aspect of the language component is harder for teachers to grasp than **functions**, or, to give them a more specific name, **academic language functions**. The functions of language, simply enough, are *the uses to which language is put.* But what does it mean to "teach functions"? If that means to "teach the uses of language," does it also involve teaching language itself? How do functions relate to structural and discourse features? Are there different types of functions? Is anything involved in teaching them (whatever that means) other than giving students a chance to practise? These and other related questions beg for answers, but few are usually forthcoming, even from ESL teachers. And if functions are a slippery topic for specialists, they are certain to be harder for content teachers to grasp. Let us try to demystify this obscure subcomponent.

It may be helpful to begin by comparing *academic language functions* (which we shall call **ALFs**) with *communicative language functions* (**CLFs**). The latter were discussed in Section 1.2, when we observed that one important objective of communicative language teaching was to develop students' proficiency in using language to express social functions like greeting, apologizing, etc. As an example, let us consider what is entailed in teaching the function of apologizing. Clearly, ESL students will already know what it means to apologize; they surely do so in their native languages all the time. We might conclude, then, that "teaching apologizing" does not mean teaching the actual function at all, since students already know it. The matter is more complicated than that, however. It is true that they will understand the general notion of what an apology is, but what they will *not* know are the *variety of English expressions* for expressing apology nor the *social conditions on their use*. Apologies in English range in force from a simple "sorry" or "pardon me" to "please accept my humble apologies," with many other expressions in between. Speakers of English automatically know which expressions to use in a given social situation, for example, that the first two of the phrases above -- but not the last -- are appropriate after accidentally brushing against someone in the hallway. Judging from this example, it appears that "learning a CLF" is mainly a matter of learning (a) the various expressions available to express the function, and (b) the social appropriateness of each.

We have discussed CLFs in some detail because they are fairly simple and may help to make academic language functions (ALFs) more easily understood. ALFs are the functions of language typical of content-area work. Defining, classifying, and hypothesizing, to choose three at random, are typical ALFs -- they are common purposes of language in academic work, though comparatively rare in everyday conversation. It should be noted that functions need not be restricted to one category or the other (communicative or academic). Some, like arguing, describing, and asking for information, qualify as both CLFs and ALFs, although the ways of accomplishing them may differ somewhat from sphere to sphere.

Let us begin our discussion of ALFs by asking what is involved in teaching them. Unlike CLFs, the functions of academic work may not be clear to ESL students. Putting this another way, students may not understand the "conceptual" side of ALFs, what it *means*, for example, to define, classify, hypothesize, evaluate, report, and so on. One of the principal aims of content-area work should be to teach students these **concepts** themselves. Obviously, however, such functions cannot be accomplished effectively except through appropriate language **forms**, so considerable attention should be devoted to teaching these as well. To go one step further, teachers might consider emphasizing the **names** of the ALFs that their students are expected to express. ALFs are the uses of academic language, and ESL students -- indeed, all students -- should certainly know what these uses are called. Summing this all up, the three important aspects of teaching ALFs can be depicted by our usual triangle, as in Fig. 1.6.

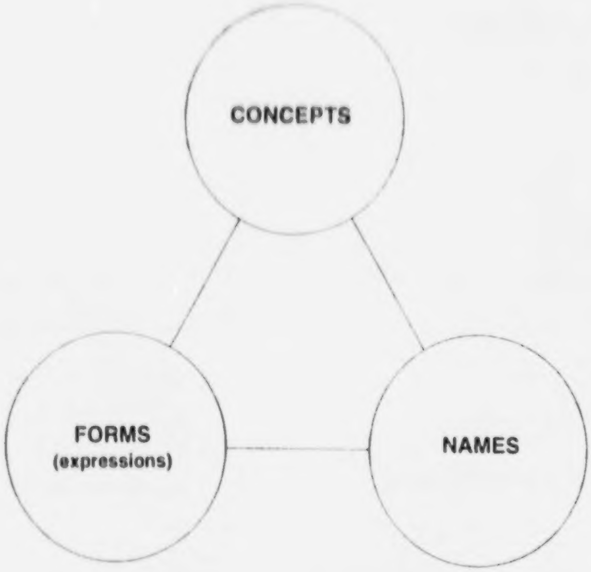


Fig. 1.6: Teaching Academic Language Functions

There is more to say about teaching ALFs, but let us digress for a moment to consider a second important question about them, one that has not been widely addressed in the literature: can they be classified into different types? We propose that there are two basic kinds of academic language function. By way of introduction, it seems that the language involved in accomplishing certain ALFs would be relatively easy to teach. Functions in this category might include comparing, contrasting, classifying, predicting, exemplifying, and hypothesizing. On the other hand, many ALFs seem so general and so unrelated to specific linguistic forms that one would scarcely know where to begin teaching them. Some functions of this type are explaining, describing, justifying, persuading, synthesizing, and evaluating.

To capture this essential difference, let us categorize ALFs into two basic types called **microfunctions** and **macrofunctions**. *Microfunctions* are small-scale; they involve the performance of rather specific language tasks with comparatively narrow purposes. *Macrofunctions*, on the other hand, are larger-scale uses in the sense that they pertain to more general language tasks with broader purposes.

The difference is reflected in the interrelated domains of syntax and discourse features. Microfunctions can generally be accomplished by means of limited stretches of discourse, one or two sentences at most. Furthermore, they tend to be realized through a relatively small number of distinctive sentence patterns, thus allowing easily identifiable form-function matchups, and are often signaled by distinctive discourse markers (e.g., *therefore, if, is/are called*). As an illustration, consider the following examples of *defining*, a typical microfunction. These are taken from a grade 10 geography textbook (Headon *et al*, 1989).

a) An *air mass* is a huge body of air containing similar weather conditions throughout.

b) These irregular deposits of varying heights **are called** *moraines*.

c) Fractures in the rocks of the earth's crust **are known as** *faults*.

d) Still further west, primarily in the semideserts of the Great Plains, soils are affected by *salinization*, **i.e.**, deposits of mineral salts left on the surface after evaporation of soil moisture.

The expressions in bold print are discourse markers commonly used (among others) for defining terms. Notice also the sentence patterns typical of this function. Other examples of defining could be added, but these should suffice to illustrate the linguistic nature of microfunctions.

Macrofunctions, in contrast, are usually accomplished through longer stretches of discourse, and are not necessarily associated with particular sentence patterns or helpful discourse signals. The reader might pause for a moment to reflect on what he or she would do if required to explain, describe, report, justify, or evaluate something. Clearly, there are no set formats for accomplishing such macrofunctions. How one chooses to go about the task depends on many factors, and it is highly improbable that any two writers (or speakers) would accomplish such a function in exactly the same way. One further point: since macrofunctions typically involve extended discourse, they are subject to linguistic analysis and description mainly on the discourse level rather than on the syntactic level.

Returning to the topic of teaching ALFs, it should be clear that procedures for teaching microfunctions will differ significantly from those needed for macrofunctions. Since microfunctions are typically related to identifiable sentence patterns and definite discourse signals, it is quite feasible for teachers to make these connections explicit. On the other hand, macrofunctions generally involve longer stretches of discourse, and are less clearly associated with distinctive formal features. Teaching these will therefore tend to be more difficult. For one thing, appropriate instruction of macrofunctions must necessarily focus more on textual and rhetorical organization than on sentence-level phenomena. But opportunities to practice such functions can be built into many content activities, provided that teachers are willing to do so, and with sufficient experience in accomplishing macrofunctions, students should eventually be able to acquire control over them.

Much more could be added here about the thorny topic of ALFs, but we hope the explanation above has succeeded in shedding some light on this important subcomponent. The sample lesson plans included in this manual will provide the reader with some practical ideas about how to teach these functions.

(3) Skills

It will not be necessary to go into as much detail about **academic language skills**, specifically, listening, speaking, reading, and writing for academic purposes. All teachers have a general understanding of what these skills are. No doubt the two literacy skills, reading and writing, are the most heavily emphasized in content-area classrooms. Both CALLA and the Foresee Approach, however, recommend that opportunities also be provided for practice of the two oracy skills, listening and speaking. Listening skills are particularly important for comprehending content-area material (lectures, explanations, instructions, etc.).

We shall not consider the matter of instructional practice here. Methods and procedures for teaching reading or writing can be found in numerous publications, and these topics are so vast that it would be futile even to begin discussing them. A good introduction to content-area reading can be found in Dubin & Bycina (1991). Some useful techniques for teaching writing skills are explained in Olshtain (1991) and Kroll (1991), and in the references cited in these articles.

We would like to make one important point about teaching academic language skills, however. Teachers should avoid the tendency to view each skill as an undifferentiated ability. The expression "knowing how to read," for example, is really quite simplistic. The two writers of this manual know how to read, but both of us (like most people) have a lot of trouble comprehending income tax manuals and insurance policies, and would doubtless be lost trying to understand journal articles about nuclear physics or medieval dissertations on theological topics. The skill of reading actually divides into a rather large set of related subskills -- reading for general ideas, reading for specific information, reading for pleasure, etc. The same is true about the other skills. Being able to write an entertaining and informative friendly letter, for example, does not mean that one can write a good formal essay.

The instructional consequences of this general idea should not be hard to perceive. Each content area makes its own special demands regarding which aspects of the four skills are important. Teachers should therefore make an effort to provide practice in those subskills which are relevant to their fields. Examples of how this can be done are contained in many of the lesson plans included in this manual.

To conclude this explanation of the language component, we would like to describe how its three subcomponents interact with each other. Referring back to Fig. 1.5, linguistic knowledge is obviously essential to the accomplishment of functions and the performance of skills. Conversely, the need to execute ALFs and to perform academic skills will stimulate constant growth of the learner's knowledge about language -- vocabulary, structures, and discourse features. As for the relationship between functions and skills, the latter are simply the modes through which the various functions are actually accomplished. The two-way arrows in Fig. 1.5 are intended to indicate this set of interactions. Clearly, the language component operates as a closely integrated unit.

3.3.3 The Learning Strategies Component

The third and last component of CALLA, the one that sets it apart from other models of integrated instruction, is the **learning strategies component**. Chamot and O'Malley have often emphasized that learning strategies are a unique feature of their approach, and in their publications and writings they generally devote considerable attention to explaining them. In their words, these strategies are "conscious techniques that facilitate learning both language and content" (1989). Chamot and O'Malley argue that students can dramatically improve their ability to understand and remember new information if they make a *deliberate effort* to learn and apply a variety of these learning strategies, ideally to the point of automaticity.

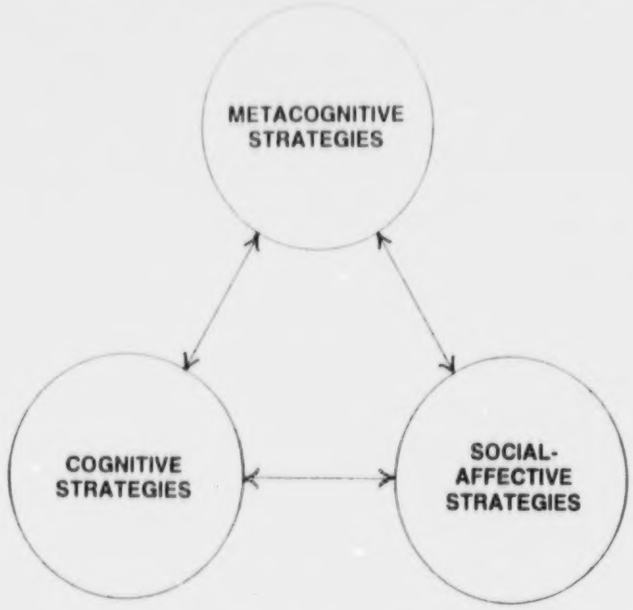


Fig. 1.7: The Learning Strategies Component

The learning strategies component is pictured in Fig. 1.7. The three categories represented in the diagram were established by Chamot and O'Malley as a result of personal research and an extensive review of previous studies of learning strategies (O'Malley & Chamot, 1990). A detailed list of learning strategies excerped from Chamot & O'Malley (1987) is shown in Table 1.1. All of the specific strategies mentioned below are taken from this table.

(1) Metacognitive Strategies

Roughly defined, metacognitive strategies are those relating to the decisions that students have to make about *how to approach or attack* learning and thinking tasks. These include strategies for:

(a) **Planning one's learning efforts.** Referring to Table 1.1, some important planning strategies included there are *advance organization* (previewing material to be learned), *selective attention* (deciding in advance to pay attention to specific language cues which will aid comprehension), and *organizational planning* (planning the structure and content of written or spoken language that the learner intends to produce). The first two of these are *receptive* strategies, while the third is a *productive* strategy.

(b) **Monitoring one's understanding as learning proceeds.** This is called *self-monitoring*. It can be receptive (periodically checking one's comprehension of written or spoken input) or productive (checking the accuracy and/or appropriateness of language produced).

(c) **Evaluating one's success at achieving an overall learning objective.** This is called *self-evaluation*. It differs from self-monitoring in that the learner evaluates how well he or she has accomplished a task after it has been completed.

(2) Cognitive Strategies

These are strategies which can be applied directly to the tasks of understanding and learning. Such strategies tend to be either *mental* or *physical*, though most can actually be utilized in either mode.

(a) **Mental Strategies.** Referring to the list in Table 1.1, a good example of a "mental" cognitive strategy is *imagery* (using visual images to understand and remember new information). Of course, it might also be possible to use real physical images for this purpose, but in our opinion this strategy is usually a mental one. Other mental strategies are *grouping*, *deduction/induction*, *auditory representation*, *elaboration*, *transfer*, and *inferencing*. (See Table 1.1 for explanations of these strategies.)

(b) **Physical Strategies.** The term "physical" means that these strategies involve the use or production of real materials, usually written. An example of a receptive cognitive strategy of this type is *resourcing* (using reference materials like dictionaries, encyclopedias, or textbooks). Productive physical strategies include *note-taking* and *summarizing*. Physical strategies are often called **study skills**, although Chamot and O'Malley prefer to avoid this term.

(3) Social-Affective Strategies

These are strategies through which the learner somehow enlists the support or assistance of other people (e.g., peers, teachers), or establishes an emotional or attitudinal state of mind conducive to success.

(a) **Social Strategies.** Chamot and O'Malley identify two of these, *questioning for clarification* (soliciting help from someone else) and *cooperation* (working with others to complete a learning task).

(b) **Affective Strategies.** The single affective strategy listed by Chamot and O'Malley is *self-talk* ("reducing anxiety by using mental techniques that make one feel competent to do the learning task").

LEARNING STRATEGIES

Learning strategy	Definition
	Metacognitive strategies
1 Advance organization	Previewing the main ideas and concepts of the material to be learned, often by skimming the text for the organizing principle
2 Organizational planning	Planning the parts, sequence, main ideas, or language functions to be expressed orally or in writing
3 Selective attention	Deciding in advance to attend to specific aspects of input, often by scanning for key words, concepts, and/or linguistic markers
4 Self-monitoring	Checking one's comprehension during listening or reading or checking the accuracy and/or appropriateness of one's oral or written production while it is taking place
5 Self-evaluation	Judging how well one has accomplished a learning activity after it has been completed
	Cognitive strategies
1 Resourcing	Using target language reference materials such as dictionaries, encyclopedias, or textbooks
2 Grouping	Classifying words, terminology, or concepts according to their attributes
3 Note taking	Writing down key words and concepts in abbreviated verbal, graphic, or numerical form during a listening or reading activity
4 Summarizing	Making a mental, oral, or written summary of information gained through listening or reading
5 Deduction/induction	Applying rules to understand or produce the second language or making up rules based on language analysis
6 Imagery	Using visual images (either mental or actual) to understand and remember new information
7 Auditory representation	Playing back in one's mind the sound of a word, phrase, or longer language sequence
8 Elaboration	Relating new information to prior knowledge, relating different parts of new information to each other, or making meaningful personal associations with the new information
9 Transfer	Using previous linguistic knowledge or prior skills to assist comprehension or production
10 Inferencing	Using information in an oral or written text to guess meanings, predict outcomes, or complete missing parts
	Social-affective strategies
1 Questioning for clarification	Eliciting from a teacher or peer additional explanation, rephrasing, examples, or verification
2 Cooperation	Working together with peers to solve a problem, pool information, check a learning task, model a language activity, or get feedback on oral or written performance
3 Self-talk	Reducing anxiety by using mental techniques that make one feel competent to do the learning task

Table 1.1: List of Learning Strategies

(Excerpted from Chamot & O'Malley, 1987)

The importance of these strategies should not be underrated. They are not a "frill" that the teacher simply "tacks onto" the content and language components of lessons. Rather, they constitute a major pathway to empowerment, a means through which students can develop into efficient and independent learners. Chamot and O'Malley strongly recommend, as we do, that they be *explicitly taught* and *consciously practised* through the vehicle of content-area work. Explicit instruction should involve teaching the *names* of the strategies, although this can be done on a simplified level (see below). Some innovative ways of providing opportunities for the practice of learning strategies are suggested in the sample lessons and units later in this manual.

Students would likely have trouble grasping all these learning strategies if the topic were presented on too sophisticated a level. To solve this problem, Chamot and O'Malley have devised a set of **color-coded sheets** (or transparencies) which list the basic strategies in each category in simplified terms. Copies of these three sheets are appended to this chapter, following the list of references. When taught via these sheets, the various strategies are comprehensible to all students, even ESL students at the elementary level. It is interesting to note the reasons behind the colors associated with the different strategy categories. Metacognitive strategies are blue, a "cool" color suitable to the reflective process of "stepping back" from a learning task and contemplating how to approach it. Cognitive strategies are green because they are fertile and productive ways of enhancing learning. Social-affective strategies are pink, a "warm" color reflecting what Chamot and O'Malley refer to as the "warm fuzzy" nature of strategies involving interpersonal relationships and personal feelings.

3.4 Implementing CALLA: An Introduction

The discussion above is a capsule summary of the *approach* inherent in the CALLA model. So far we have focused exclusively on the **content** of a CALLA lesson -- **what** it should include. In this section we would like to consider briefly the question of **how** CALLA can be implemented. Our concern here, then, is with the methods and techniques that constitute instructional practice.

Chamot and O'Malley propose that a CALLA lesson should be divided into **five phases**, as follows.

(a) **Preparation.** The teacher prepares the students for the lesson by helping them focus on the topic (e.g., students recall prior knowledge through brainstorming).

(b) **Presentation.** The teacher presents the new material by explaining it, having students read it, or in some other fashion.

(c) **Practice.** The students are asked to participate in some activity or to accomplish some meaningful task which will provide them with an opportunity to "actively manipulate both the concepts presented and the language skills needed to understand and express the new information" (Chamot & O'Malley, 1986).

(d) **Evaluation.** After (or sometimes during) the practice phase, some kind of evaluation of the students' understanding should occur. This can be accomplished in a number of ways (e.g., by the teacher, as a cooperative peer activity, or through self-evaluation).

(e) **Follow-up (Expansion).** The teacher introduces some activity "that provides students with an opportunity to integrate the new concepts and skills acquired in the lesson into their existing knowledge framework" (Ibid.).

This scheme obviously furnishes interested teachers with some useful guidelines for instructional planning. It constitutes an excellent format or framework for including all three CALLA components -- content, language, and learning strategies -- in the design of effective lessons. Nevertheless, it contains little in the way of detail about how teachers might exploit the subject matter of their content areas to plan and deliver interesting, exciting, and motivating lessons. In order to accomplish this, we argue, teachers must possess a repertoire of specific techniques and procedures for implementing CALLA in their classrooms. The best way to begin developing such a repertoire, we are convinced, is to carefully examine a variety of CALLA-based lessons and units that have been created -- and preferably tested in practice -- by teachers who are both familiar with the CALLA model and experienced in its application.

As mentioned earlier, the sample lesson and unit plans in this manual are intended for this purpose. We are confident that careful study of these will greatly reward the serious teacher who desires to implement one possible version of CALLA-based instruction in his or her classroom. The version we recommend, as the reader is by now fully aware, is called the Foresee Approach (see below). This is our own particular interpretation and application of CALLA and the various other "foundations" discussed earlier in this chapter.

This chapter has presented a great deal of background information on the Foresee Approach, and has pointed the way to its implementation. There is yet another important step to be taken, however, before the sample lesson and unit plans to follow can be fully understood and appreciated. The **application** of our approach is based on a synthesis of **theory** and high-quality available **materials** that teachers can adapt to their purposes in preparing effective lessons and units for developing the academic knowledge and skills (content, language, and learning strategies) of their ESL students. The nature of this synthesis is explained in Chapters 2 and 3.

4. The Foresee Approach

4.1 Why not "CALLA"?

Why not simply "CALLA"? Our approach is based so extensively and unabashedly on that of Chamot and O'Malley, critics may argue, that we might as well adopt CALLA directly as our model of instruction. Well, in the first place, "CALLA" is a copyrighted term, so we couldn't use it if we wanted to. But we believe there are three other good reasons for referring to our approach by a special name.

The first is that our Foresee Approach is not based *only* on CALLA. It is true that CALLA is the major foundation, but our model is erected also upon the other foundations discussed in Section 2 of this chapter. Many of these (e.g., Cummins's theories, cooperative learning, and of course strategies) are also incorporated within CALLA in one fashion or other, but not all are. Vygotsky's theory of learning and teaching, for example, is not. The Foresee Approach, clearly, encompasses more than just CALLA.

The second reason for inventing a new name is that our version of CALLA includes several modifications to Chamot and O'Malley's model. They do not, for example, make use of the 3-way triangular model we have introduced here, used once again to represent the Foresee theoretical model shown in Fig. 1.8. Furthermore, their language component does not consist of three elements, as ours does, and their account of academic language functions (or *ALFs*, another term original with us) does not differentiate between microfunctions and macrofunctions. Perhaps the major innovation in our interpretation of CALLA is our detailed analysis of the language component, which Chamot and O'Malley de-emphasize in favor of the learning strategies component. Other minor differences could be noted here, but it should be clear from these few examples that the account of CALLA presented above differs from the original version advanced by Chamot and O'Malley (1986, 1987, 1989). It seemed an appropriate decision, therefore, to call our model by a different name.

The third reason for this decision -- probably the major reason, in fact -- lies in the realm of practical application. Although we make use of many of the methodological ideas suggested by Chamot and O'Malley (e.g., the 5-stage lesson), the Foresee Approach embodies an original, very specific *process* for constructing lesson and unit plans. The essential features of this process will become clear in subsequent chapters.

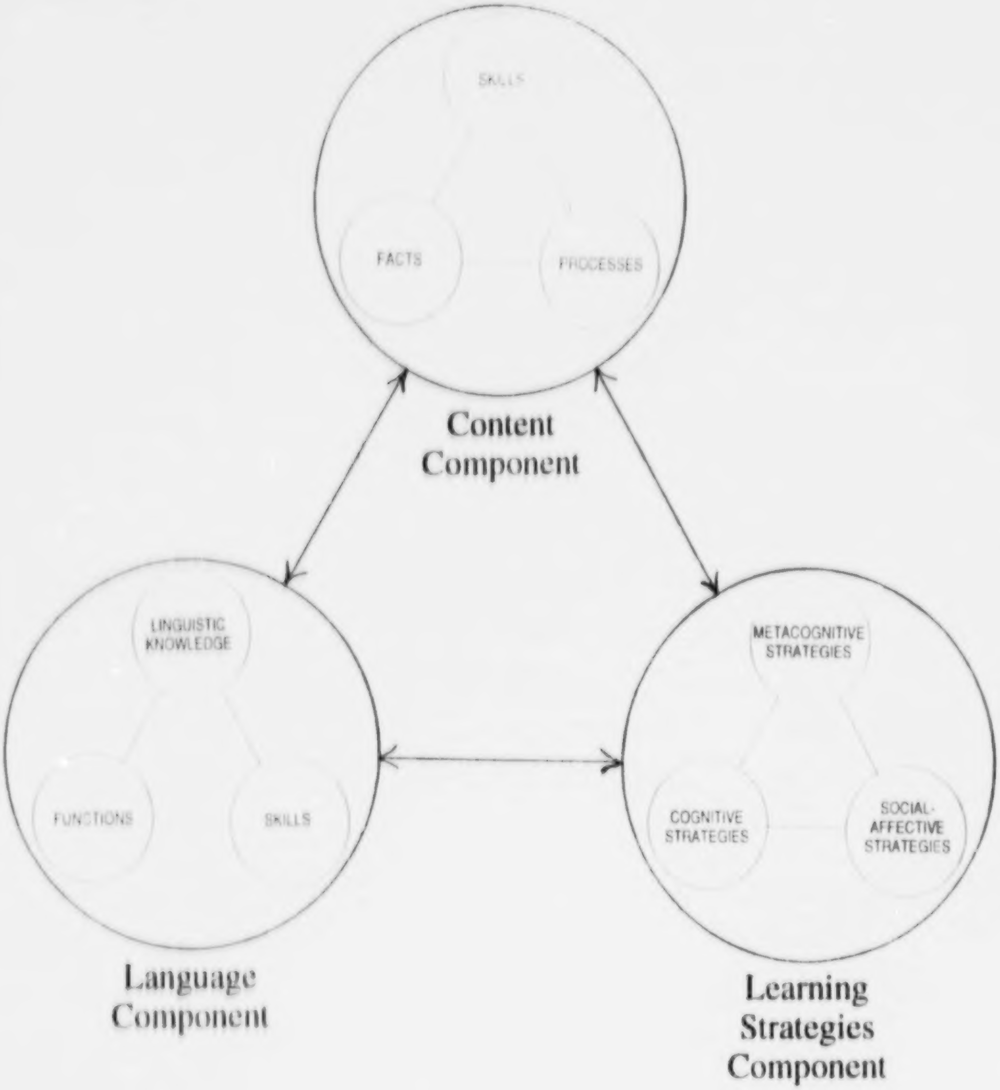

SKILLS
FACTS
PROCESSES
Content Component
LINGUISTIC KNOWLEDGE
FUNCTIONS
SKILLS
Language Component
METACOGNITIVE STRATEGIES
COGNITIVE STRATEGIES
SOCIAL-AFFECTIVE STRATEGIES
Learning Strategies Component

Fig. 1.8: The Foresee Model

5. The Continuing Need for ESL Teachers

As emphasized at the beginning of this chapter (Section 1.1), the Foresee Approach can be utilized by both ESL teachers and regular classroom teachers. Because the integrated instruction that we recommend is bound to result in ongoing language development through mainstream content-area work, some teachers and administrators may leap to the conclusion that the widespread implementation of our approach across the curriculum may reduce the need for ESL teachers or, indeed, eliminate this need altogether. We believe such a conclusion to be completely unwarranted, and we would like to conclude this chapter by expressing our vigorous opposition to any policy aimed at phasing out ESL teachers in our schools. For two decisive reasons, one theoretical and one practical, qualified ESL teachers would continue to be necessary even if the Foresee Approach should come to enjoy broad acceptance and application across the content-area spectrum.

The theoretical reason, surely a compelling one, is that Foresee (like CALLA) *is not designed to meet the needs of beginner-level ESL students*, i.e., those who enter our schools with virtually no knowledge of English. The first and crucial need of such students is to acquire a satisfactory degree of *communicative competence*, what Cummins (1979) called BICS -- basic interpersonal communicative skills. As explained in Section 1.2 above, this sort of competence consists of control over the English vocabulary, structures, rules of social appropriateness, etc., that students require in order to get along in everyday social situations. It involves the ability to use language to perform important social functions like greeting, apologizing, accepting invitations, and the like. Such concerns lie almost entirely outside the domain of CALP and, *ipso facto*, are irrelevant to Foresee or CALLA. Most regular classroom teachers, even those versed in Foresee, would obviously lack the specialized training required *to help students develop this aspect of proficiency as quickly as possible*. The responsibility for doing so should continue to fall on the ESL teacher, who ideally possesses the necessary expertise to accomplish this task. Such expertise naturally includes an extensive knowledge of modern communicative language teaching (CLT) methods, as well as skill in applying these. It also includes an understanding of how to teach special aspects of language like pronunciation, basic grammar, and communicative language functions.

The Foresee Approach, like CALLA, was designed as a "bridge to the mainstream" (Chamot & O'Malley, 1987), although this "bridge" can be located within the mainstream classroom itself. Its purpose is to enhance the development of academic language proficiency, Cummins's CALP. We vehemently argue that it would be absurd to expect ESL students to cope with the language demands of content-area work prior to the acquisition of an adequate measure of basic communicative competence. Any regular classroom teacher who has attempted to teach the regular curriculum to students with zero English proficiency will surely concur, and training teachers to use the Foresee Approach will not help them to cope with such students any better than they have been able to do in the past. It would clearly be a serious error, then, to phase out ESL teachers entirely, since ESL specialists must continue to perform the crucial task of equipping beginner-level ESL students with the communicative competence required as a fundamental base for the development of academic language competence and for participation in content-area work.

There is a second reason, a more practical one, for retaining ESL specialists in our schools. Since most content-area teachers

> may be ill-prepared to "teach" language or even to recognize students' language-learning needs because of lack of training in language-teaching pedagogy, language teachers [should] become pedagogical resources for mainstream teachers who are willing to assume some responsibility for treating students' language needs (Snow, Met, & Genesee, 1989).

This latter group, obviously, would include all regular classroom teachers using the Foresee Approach. A lack of knowledge, both linguistic and pedagogical, will pose an especially acute problem for such teachers, because Foresee (like CALLA) is a sophisticated approach which demands a considerable amount of technical expertise for proper application. The logical source of such expertise within a school is the ESL teacher, whose knowledge about language, Foresee methodology, and useful materials can serve as a vital resource for mainstream teachers attempting to plan which aspects of linguistic knowledge, academic language functions, learning strategies, etc., to include in their lessons. As we see it, collaboration between ESL specialist teachers and classroom teachers is an essential ingredient of successful Foresee instruction across the curriculum. Widespread implementation of Foresee-enhanced instruction in our schools will therefore not obviate the need for trained ESL specialist teachers.

REFERENCES

Anderson, J.R. (1985). *Cognitive psychology and its implications* (Second Edition). New York: Freeman.

Ausubel, D.A. (1968). *Educational psychology: A cognitive view*. New York: Holt, Rinehart, & Winston.

Brinton, D.M., M.A. Snow, & M.B. Wesche. (1989). *Content-based second language instruction*. New York: Newbury House.

Cantoni-Harvey, G. (1987). *Content-area language instruction*. Reading, MA: Addison-Wesley.

Carrell, P. (1983). Some issues in studying the role of schemata, or background knowledge, in second language comprehension. *Reading in a Foreign Language, 1*, 81-92.

Chamot, A.U. & J.M. O'Malley. (1986). *A cognitive academic language learning approach: An ESL content-based curriculum*. Wheaton, MD: National Clearinghouse for Bilingual Education.

Chamot, A.U. & J.M. O'Malley. (1987). The cognitive academic language learning approach: A bridge to the mainstream. *TESOL Quarterly, 21*(2), 227-249.

Chamot, A.U. & J.M. O'Malley. (1989). The cognitive academic language learning approach. In P. Rigg & V.G. Allen (Eds.), *When they don't all speak English: Integrating the ESL student into the regular classroom*. Urbana, IL: National Council of Teachers of English, 108-125.

Chastain, K. (1976). *Developing second language skills: Theory to practice* (Second Edition). Chicago: Rand McNally.

Coelho, E. (1988). Creating jigsaw units for the ESL classroom. *TESL Talk 18*(1), 69-81.

Crandall, J. (Ed.). (1987). *ESL through content-area instruction: Mathematics, science, social studies*. Englewood Cliffs, NJ: Prentice Hall Regents.

Cummins, J. (1979). Linguistic interdependence and the educational development of bilingual children. *Review of Educational Research, 49*(2), 222-251.

Cummins, J. (1983). Language proficiency and academic achievement. In J. W. Oller, Jr. (Ed.), *Issues in language testing research*. Rowley, MA: Newbury House.

Dubin, F. & D. Bycina. (1991). Academic reading and the ESL/EFL teacher. In M. Celce-Murcia (Ed.), *Teaching English as a second or foreign language* (Second Edition). New York: Newbury House, 195-215.

Enright, D.S. & M.L. McCloskey. (1988). *Integrating English*. Reading, MA: Addison-Wesley.

Gamberg, R., W. Kwak, M. Hutchings, & J. Altheim. (1988). *Learning and loving it: Theme studies in the classroom.* Portsmouth, NH: Heinemann.

Gilles, C., M. Bixby, P. Crowley, S.R. Crenshaw, M. Henrichs, F.E. Reynolds, & D. Pyle (Eds.). (1988). *Whole language strategies for secondary students.* New York: Richard C. Owen Publishers, Inc.

Gillham, B. (Ed.). (1986). *The language of school subjects.* London: Heinemann.

Goodman, Y. M. & K.S. Goodman. (1990). Vygotsky in a whole language perspective. In L.C. Moll (Ed.), *Vygotsky and education: Instructional implications and applications of sociohistorical psychology.* Cambridge: Cambridge University Press, 223-250.

Headon, F.W., J.R. Lohrenz, R. Humphrey, & B. Mueller. (1989). *Continent of contrast: A study of North America* (Revised Edition). Toronto: Oxford University Press.

Jacob, E. & B. Mattson. (1987). Cooperative learning with limited-English-proficient students. Q & A. Washington, DC: ERIC/CLL Center for Language Education and Research. [ERIC ED 287 314].

Johnson, D.W., R. Johnson, E.J. Holubec, & P. Roy. (1984). *Circles of learning: Cooperation in the classroom.* Alexandria, VA: Association for Supervision and Curriculum Development. [ERIC ED 241 516].

Kagan, S. (1985). *Cooperative learning resources for teachers.* Riverside, CA: University of California, Riverside, Printing and Reprographics.

Kagan, S. (1986). Cooperative learning and sociocultural factors in schooling. In Bilingual Education Office, California State Department of Education (Ed.), *Beyond language: Social and cultural factors in schooling language minority students.* Los Angeles: Evaluation, Dissemination, and Assessment Center, California State University, 231-298.

Kidd, R. & B. Marquardson (1992). CALLA-based techniques for the regular classroom. *TESL Manitoba Journal, 8*(1), 2-8.

Krashen, S.D. (1982). *Principles and practice in second language acquisition.* Oxford: Pergamon.

Krashen, S.D. & T.D. Terrell. (1983). *The natural approach.* Hayward, CA: Alemany Press.

Kroll, B. (1991). Teaching writing in the ESL context. In M. Celce-Murcia (Ed.), *Teaching English as a second or foreign language* (Second Edition). New York: Newbury House, 245-263.

A Language for life: Report of the committee of inquiry appointed by the Secretary of State for Education and Science under the chairmanship of Sir Alan Bullock F.B.A. (1975). London: Her Majesty's Stationery Office.

Maslow, A.H. (1971). *The farther reaches of human nature*. New York: Viking Press.

Mayer, R.E. (1988). Learning strategies: An overview. In C.E. Weinstein, E.T. Goetz, & P.A. Alexander (Eds.), *Learning and study strategies: Issues in assessment, instruction, and evaluation*. San Diego: Harcourt Brace Jovanovich (Academic Press), 11-22.

McGroarty, M. (1992). Cooperative learning: The benefits for content-area teaching. In P.A. Richard-Amato & M.A. Snow (Eds.), *The multicultural classroom: Readings for content-area teachers*. New York: Longman, 58-69.

Mohan, B.A. (1986). *Language and content*. Reading, MA: Addison-Wesley.

Moskowitz, G. (1978). *Caring and sharing in the foreign language class*. Rowley, MA: Newbury House.

Naiman, N., M. Frolich, H.H. Stern, & A. Todesco. (1978). *The good language learner*. Toronto: OISE.

Norman, D.A. (1980). Cognitive engineering and education. In D.T. Tuma & F. Reif (Eds.), *Problem solving and education*. Hillsdale, NJ: Erlbaum.

Olshtain, E. (1991). Functional tasks for mastering the mechanics of writing and going just beyond. In M. Celce-Murcia (Ed.), *Teaching English as a second or foreign language* (Second Edition). New York: Newbury House, 235-244.

O'Malley, J.M. & A.U. Chamot. (1990). *Learning strategies in second language acquisition*. Cambridge: Cambridge University Press.

Oxford, R. (1985). *A new taxonomy of second language learning strategies*. Washington, DC: ERIC Clearinghouse on Languages and Linguistics.

Oxford, R. (1990). *Language learning strategies: What every teacher should know*. New York: Newbury House.

Rogers, C.R. (1956). What it means to become a person. In C.E. Moustakas (Ed.), *The self: Explorations in personal growth*. New York: Harper & Row.

Rogoff, B. & W. Gardener. (1984). Adult guidance of cognitive development. In B. Rogoff & J. Lave (Eds.), *Everyday cognition: Its development in social contexts*. Cambridge, MA: Harvard University Press, 95-116.

Rogoff, B. & J. Wertsch (Eds.). (1984). *Children's learning in the "zone of proximal development."* New Directions for Child Development, 23. San Francisco: Jossey-Bass, Inc.

Rubin, J. (1975). What the "good language learner" can teach us. *TESOL Quarterly, 9*, 41-51.

Rubin, J. (1981). Study of cognitive processes in second language learning. *Applied Linguistics, 11*, 117-131.

Seal, B.D. (1991). Vocabulary learning and teaching. In M. Celce-Murcia (Ed.), *Teaching English as a second or foreign language* (Second Edition). New York: Newbury House, 296-311.

Short, D.J., J.A. Crandall, & D. Christian. (1989). *How to integrate language and content instruction: A training manual.* Los Angeles: Center for Language Education and Research, UCLA. [ERIC ED 305 824].

Slavin, R. (1983). *Cooperative learning.* New York: Longman.

Snow, M.A. (1991). Teaching language through content. In M. Celce-Murcia (Ed.), *Teaching English as a second or foreign language* (Second Edition). New York: Newbury House, 315-328.

Snow, M.A., M. Met, & F. Genesee. (1989). A conceptual framework for the integration of language and content in second/foreign language instruction. *TESOL Quarterly, 23*(2), 201-217.

Spanos, G. (1990). On the integration of language and content instruction. In R.B. Kaplan (Ed.), *Annual Review of Applied Linguistics, 10*, Cambridge University Press, 227-240.

Tharp, R.G. & R. Gallimore. (1988). *Rousing minds to life.* Cambridge: Cambridge University Press.

Vygotsky, L.S. (1956). *Selected psychological investigations.* Moscow: Izdstel'sto Academii Pedagogicheskikh Nauk SSSR.

Vygotsky, L.S. (1978). *Mind in society.* Edited by M. Cole, V. John-Steiner, S. Scribner, & E. Soubermann. Cambridge, MA: Harvard University Press.

Weaver, C. (1990). *Understanding whole language: From principles to practice.* Portsmouth, NH: Heinemann.

Weinstein, C.E. (1987). Fostering learning autonomy through the use of learning strategies. *Journal of Reading, 40*, April 1987.

Weinstein, C.E. & R.E. Mayer. (1986). The teaching of learning strategies. In M.C. Wittrock (Ed.), *Handbook of research on teaching*, 3rd. Edition. New York: Macmillan Publishing Co., 315-327.

Wood, D., J.S. Bruner, & G. Ross. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry, 17*, 89-100.

METACOGNITIVE STRATEGIES

THINK: How do I learn?
How can I learn more?

WHAT I CAN DO:

PLAN what I will do.

MONITOR what I am doing.

EVALUATE what I have done.

COGNITIVE STRATEGIES

THINK: How can I understand?
How can I remember?

WHAT I CAN DO:

ELABORATE prior knowledge.

TAKE NOTES of important ideas.

CLASSIFY or **GROUP** ideas.

Make **INFERENCES** and **PREDICT**.

SUMMARIZE important ideas

Use **IMAGES** and **PICTURES**.

HELP! HELP! HELP! HELP! HELP! HELP! HELP! HELP! HELP!
HELP! HELP! HELP! HELP! HELP! HELP! HELP! HELP! HELP!
HELP! HELP!
HELP! HELP!
HELP! HELP!
HELP! HELP!
HELP! HELP!
HELP! HELP!
HELP! **SOCIAL AND AFFECTIVE STRATEGIES** HELP!
HELP! HELP!
HELP! HELP!
HELP! HELP!
HELP! HELP!
HELP! HELP!
HELP! THINK: How can I help others learn? HELP!
HELP! How can others help me learn? HELP!
HELP! HELP!
HELP! HELP!
HELP! HELP!
HELP! HELP!
HELP! WHAT I CAN DO: HELP!
HELP! HELP!
HELP! HELP!
HELP! ASK QUESTIONS for clarification. HELP!
HELP! HELP!
HELP! COOPERATE with classmates to learn. HELP!
HELP! HELP!
HELP! Use positive SELF-TALK. HELP!
HELP! HELP!
HELP! HELP!
HELP! HELP!
HELP! HELP!
HELP! HELP!
HELP! HELP!
HELP! HELP! HELP! HELP! HELP! HELP! HELP! HELP! HELP!
HELP! HELP! HELP! HELP! HELP! HELP! HELP! HELP! HELP!

Chapter 2

Materials: The Key to Application

Chapter 2

Materials: The Key to Application

1. Applying the Foresee Approach.

Good materials form the concrete component of the Foresee Approach. Such materials, selected and perhaps adapted by the teacher, are essential to effective practical application of the theoretical model presented in the previous chapter. If a teacher does not have access to actual "hands on" materials which can serve as the nucleus of classroom instruction, the Foresee Approach cannot be properly implemented. In a word, the materials provide the ***vehicle*** for the effective practical application of the theory.

Notwithstanding the importance of materials, however, we emphasize that teachers must have an adequate background knowledge of the Foresee model itself, since a solid theoretical understanding is invaluable in helping the teacher to decide which materials to select. The selection process is a crucial one, and generally takes a great deal of time and effort. Once suitable materials have been chosen, the teacher can use them as the concrete means for applying the theory implicit in the Foresee model. The **theoretical model**, as illustrated in Fig. 1.8 of Chapter 1, provides the criteria for establishing instructional objectives (content, language, and learning strategies), but the **materials** constitute the actual subject matter which the teacher can use as the basis for devising classroom procedures, activities, exercises, etc. The **application** of the Foresee Approach can therefore be regarded as a *synthesis* of theory and materials, as depicted in Fig. 2.1 below.

We should observe at this point that if teachers have not yet acquired the necessary experience in implementing our model, smooth and skillful application of materials to Foresee purposes can often prove difficult. Initially, the teaching suggestions and activities provided in teachers' manuals may have to be heavily relied upon. As teachers become more familiar with the materials and their potential applications, however, they will begin to reassess or to question some of these applications on the basis of the theoretical knowledge they have acquired. As new theoretical insights (e.g., the nature of the learning component and learning strategies) become assimilated, the applications may be improved to incorporate the new ideas. As the applications are improved, the old materials sometimes become irrelevant and ineffective. Teachers may begin to look for different ways to manipulate the content, changing their selection of materials to achieve restated objectives. The selection and manipulation of the new materials will enable these teachers to develop new theoretical understandings. The resulting readjustment of their theoretical perspective, incorporating the new knowledge, will be reflected in a more refined and sophisticated application. Teachers will then have "fine tuned" the application, both theoretically and practically, justifying what they are doing and how they are doing it. The entire application process can be summed up in Fig. 2.1, which once again takes the form of our familiar triangle.

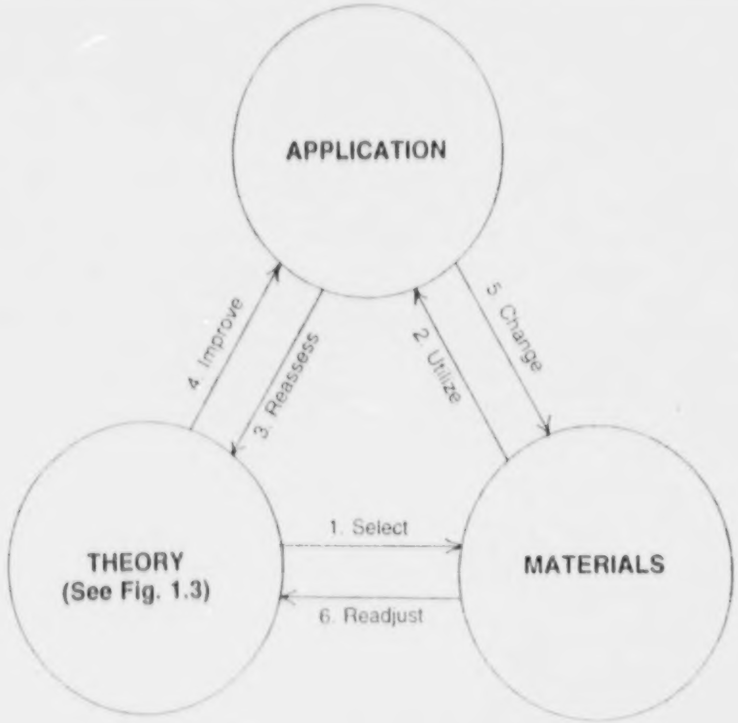


Fig. 2.1: Application of the Foresee Approach

If teachers lack a solid theoretical understanding of the Foresee theoretical model, which is a crucial foundation for application, it is unlikely that they will have the expertise to select, utilize, reassess, improve, change, or readjust materials. The teacher's manual will likely be followed "to the letter," and the knowledge of how to manipulate the materials to maximum effect will not be acquired. The main reason for this, of course, is that the theory generates the objectives, particularly the language and learning strategies objectives, that are crucial to true Foresee instruction.

As a final comment by way of introduction, the materials chosen as the basis for classroom activities will be dependent upon which themes or topics are chosen for the units which the teacher decides to develop. An explanation of how to plan and develop a Foresee unit will be presented in the following chapter.

2. Selection of Materials.

There are a number of excellent resources or materials available for integrating language and content. Some of these provide teachers with concrete suggestions and activities which can aid in the fulfilling of the content, language, and learning strategies objectives generated by the Foresee model. These materials promote active involvement and interaction of the students in real learning situations rather than superficial ones.

2.1 Criteria of Good Materials.

Good materials:

a) integrate and promote basic interpersonal communicative skills (BICS) and cognitive academic language proficiency (CALP) (Cummins, 1979; see Chapter 1).

b) allow the formulation of realistic and valuable content, language, and learning strategies objectives, as generated by the Foresee theoretical model.

c) are flexible and easily manipulated, and can therefore be adapted or modified to the needs of the students. It is particularly important that written texts be easily modifiable, so that they may be made comprehensible to ESL students.

d) are exciting, both visually and in content. Perhaps the most important criteria for selecting materials are that the visuals or pictures should be in color, should be appealing, and should provide comprehensible input. (Note: Visuals and demonstrations are invaluable sources of contextual support for cognitively demanding content, and if they are utilized appropriately, the resulting Foresee instruction will lie squarely in quadrant 3 of Cummins' 2-dimensional theoretical framework for language proficiency, as described in Section 2.2.2 of Chapter 1.) If the materials excite the teacher, they will excite the students as well. Needless to say, if a teacher must constantly revise materials to try to make them work, they will not be interesting to the students. The materials should be so exciting and motivating that when students see the activities that their classmates in other groups have done, they will be eager to do these as well.

2.2. Where to Find Good Materials.

a) **Publishers' Displays.** A publishers' display at any conference is an excellent source of real, current, and innovative materials. The discovery of wonderful new materials can often excite and encourage teachers to try different ways of thinking, and may lead to more innovative teaching practices. Ultimately the students reap the benefits of these innovative techniques, which are inspired by the manipulation of the new materials.

Teachers should always strive to find good materials which will assist them, as well as motivate them, to develop new themes or units. They should *not* become complacent once a few good units have been developed, satisfying themselves by reteaching those same units year after year and using the same resources. Teachers should constantly keep on the lookout for new materials which can promote change by stimulating and encouraging an ongoing evolution in instructional practices.

b) **Catalogues.** Catalogues are good resources, but only if the actual materials have been seen. If they have not, the teacher must resort to guesswork in deciding what to order, and more often than not the materials that arrive will fail to live up to expectations.

c) **Word of Mouth.** Teachers can easily use their colleagues as resources. Other respected ESL teachers can often be relied upon to provide information about recommended materials, why and how they use them, etc. Teachers may even visit their colleagues' classrooms to observe the materials and their applications in actual use. As a general rule, paying attention to word of mouth reports is probably the surest and most reliable way of determining which resources or materials are most effective, useful, and accessible.

A list of excellent materials which can be used for integrating language and content appears at the end of this chapter. All of the materials recommended contain many good sections, lessons, and units that are readily adaptable to effective Foresee instruction.

3. The Value of Accumulating Materials.

Accumulating a large supply of materials is important to teachers concerned with teaching content, language, and learning strategies. It is important to have the concrete materials "at your fingertips" when developing a thematic unit, or the developmental process of the unit can stagnate. During the development of a unit, it is amazing how well an experienced ESL teacher can remember and recall the pertinent information, resources, and activities in the particular materials he or she has accumulated. Such recall allows ESL teachers to pull all of their resources together effectively in planning interesting and exciting thematic units.

One of the important duties of an ESL teacher is to ensure the successful integration of ESL students into their regular classrooms. This can be accomplished by assisting classroom teachers to integrate content, language, and learning strategies objectives into their own teaching units. To ensure cooperative collaboration, the ESL teacher should possess an abundance of effective materials to supply to classroom teachers when illustrating how to manipulate the content to incorporate all the necessary Foresee components. If the ESL teacher has an enticing supply of materials on hand, classroom teachers will appreciate being able to approach such a specialist for his or her excellent materials and ideas which are visually exciting and easily understood.

It should be mentioned, however, that even though the ESL teacher must have sufficient materials for the classroom teacher to use in developing ***language-sensitive content-area*** units, he or she must still have enough materials to complement the classroom units through ***content-based language instruction*** (i.e, instruction in the ESL class).

In conclusion, willing cooperation between the ESL teacher and the regular classroom teacher is essential for sincere communication and collaboration. The end product of a cooperative, collaborative policy is bound to be vastly improved instruction for the ESL/LEP students in our schools, both in ESL and in content-area classrooms.

4. A Resource List of Exemplary Materials.

The following books are highly recommended as sources of interesting, motivating, and adaptable materials for planning Foresee lessons and units. We have drawn heavily upon the first four of these in designing the elementary-level units described in Chapters 4-6.

The list below is certainly not intended to be exhaustive. Experienced teachers will likely be familiar with other resources containing high-quality textual materials, visual supports, stories, etc., for use at their particular level. Actually, almost *anything* can serve as a potential resource -- books, magazines, newspapers, encyclopedias, etc. But we have drawn extensively from the materials below in planning successful instructional units, and we offer them as a starting point for teachers who might be interested in applying the Foresee Approach in their classrooms.

We suggest that teachers write away for free catalogues on these materials. Such catalogues can be used as a basis for ordering particular books that will meet the individual needs of each instructional situation. We include the names and addresses of the publishers and/or Canadian distributors of all the resources we have selected.

Useful Materials

Bridge to Communication. (1992). San Diego: Santillana Publishing Company, Inc.

- Primary Levels A, B, & C.
- Middle Levels A, B, & C.
- Secondary Levels A,B, & C.

Write to:
Santillana Publishing Company, Inc.
901 W. Walnut St.
Compton, CA 90220-5109
U.S.A.

Open Sesame English as a Second Language Series. (1985). New York: Oxford University Press.

The entire series can be used, but for purposes of elementary-level content-area instruction, we recommend especially:

- *Prairie Dawn's Purple Book*, Teacher's Book.
- *Ernie and Bert's Red Book*, Teacher's Book.

New Oxford Picture Dictionary. New York: Oxford University Press.

Useful at all levels.

Information on both the *Open Sesame* series and the *Picture Dictionary* can be obtained from:

Oxford University Press
70 Wynford Rd.
Don Mills, ON
M3C 1J9

Addison-Wesley ESL Series. (1992). Reading, MA: Addison-Wesley Publishing Co.

For elementary-level instruction, we recommend the Student Books for Levels B, C, D, & E.

Write to:
Addison-Wesley Publishing Co.
P.O. Box 580
26 Prince Andrew Place
Don Mills, ON
M3C 2T8

Chamot, A.U., J.M. O'Malley, & L. Kupper (1992). ***Building Bridges: Content and Learning Strategies for ESL.*** Boston, MA: Heinle & Heinle Publishers.

Books 1, 2, & 3 (Student Editions) are all useful, especially at the secondary level.

Write to:

Nelson Canada
1120 Birchmount Rd.
Scarborough, ON
M1K 5G4

Prism: An Intermediate English Course. (1992). Toronto: Harcourt Brace Jovanovich.

We recommend Student Books 1, 2, & 3, especially for the secondary level.

Spotlight: An English Course. (1992). Toronto: Harcourt Brace Jovanovich.

We recommend Student Books 1, 2, & 3, especially for the secondary level.

For information on *Prism* and *Spotlight*, write to:

Harcourt Brace Jovanovich
55 Horner Ave.
Toronto, ON
M8Z 4X6

Chapter 3

Implementing the Approach: The Development of Foresee Lessons and Units

Chapter 3

Implementing the Approach:
The Development of Foresee Lessons and Units

1. Lesson and Unit Planning.

In planning and developing a lesson or a unit using the Foresee Approach, the teacher can follow an orderly progression of steps. Each step is dependent upon, and evolves from, those preceding it. The purpose of this chapter is to explain the details of the planning and development procedure, which constitutes the practical stage of Foresee application.

(a) The First Step is choosing the theme or topic for the unit. This decision relates directly, of course, to the selection of content. For regular classroom teachers, the choice is usually quite easy, since the curriculum can readily provide the necessary guidelines. For ESL teachers, in contrast, the selection process may not be as straightforward, and a good deal of latitude is ordinarily possible. ESL teachers should collaborate with regular classroom teachers in choosing topics or themes which *parallel*, rather than replicate, items in the mainstream curricula. The goal of integrated instruction within the ESL classroom should be to equip students with some of the content-specific linguistic knowledge and skills, as well as effective learning strategies, that will later serve to promote academic success in regular coursework. Choosing the topic is the most important and difficult decision for the ESL teacher because all the subsequent steps are dependent upon the chosen content. As Chamot and O'Malley themselves asserted in one of their presentations at the 1992 TESL Manitoba Conference, "everything is content-driven."

It should also be noted that the resources and materials available will also determine the choice of topic to some degree. Obviously, teachers will be tempted to select topics or themes for which they have ready access to attractive materials, as described in the previous chapter. As a final point, Chamot and O'Malley suggest that ESL teachers "choose high priority content, because they can't teach *all* of the content available" (Keynote Address, 1992 TESL Manitoba Conference).

(b) The second step is to select effective materials and resources as the basis of Foresee application, as discussed in Chapter 2. Materials which are rich in visual supports such as pictures, charts, graphs, diagrams, manipulatives, etc., will give rise to exciting and motivating learning activities. The materials therefore have a major impact on the quality of the unit.

(c) The third step is to determine the *content objectives* for the unit and for each lesson plan. The classroom teacher's content objectives tend to be quite specific and detailed, since the learning of the targeted content is usually the major aim of instruction. But even though the mainstream teacher's primary interest is content instruction, mastery of content by the students should not be viewed as an end in itself. Under the Foresee Approach, the content is also a vehicle for the teaching of language skills and learning strategies. The ESL teacher's content objectives, in contrast, will often be more general, with the content treated mainly as a means for teaching these other components. The difference in emphasis is reflected in the two terms introduced at the beginning of Chapter 1: *language-sensitive content instruction* vs *content-based language instruction*.

But although the content objectives chosen in the two teaching contexts may differ, there may be considerable similarity in the general manner in which ESL and regular classroom teachers develop their lessons and units. For both, effective application of the materials requires the development of learning activities which encourage the students to manipulate and interact with the content in ways which will ensure their understanding and retention.

(d) The fourth step is to develop and write the actual lesson plans for the unit. This procedure will be illustrated in considerable detail in subsequent chapters. Briefly, each lesson plan as conceived at this stage consists of *content objectives* plus *lesson procedures*. Information about the organization of procedures will be given in Section 2 of this chapter.

(e) The fifth step is to identify the language objectives of each individual lesson This is done at various stages during what we might call the "evolution" of each lesson plan. Some general language objectives may be determined before the actual lesson plans are written down, at the stage where the teacher may be developing an overall unit plan. Some examples of general objectives of this sort are writing a research report and making a summary. Other language objectives may be identified, and integrated into a lesson plan, as the procedures of the lesson are being decided upon and listed. Finally, after the actual lesson plan has been completed, it may be reexamined with a view towards identifying further specific language objectives that might be taught through the chosen content.

Regardless of the stage where they are identified or selected, the language objectives of a lesson can be categorized according to the scheme of the Foresee language component (see Section 3.3.2 and Figure 1.5 of Chapter 1). The language objectives might therefore include the following:

(1) **Linguistic Knowledge.**

- i) **Vocabulary** -- not only specialized academic vocabulary but also common, everyday words, including those which have special meanings in particular subject areas (e.g., *force* and *energy* in science). Content vocabulary may also include difficult "academic" words that are uncommon in everyday communication but widely used across the various content areas (e.g., *estimate, approximate, consequently,* and *summarize*). It is important that teachers be very specific about the vocabulary items they plan to teach in any lesson, and that they list them all as part of their lesson plan. Only then can they be sure that vocabulary instruction is complete and effective.
- ii) **Structures** -- grammatical structures which can be taught during the course of the lesson via the content work. Some examples are the various verb tenses (present, past, present perfect, etc.), the passive voice, articles, prepositions, comparative and superlative forms of adjectives, pronouns, relative clauses, and common syntactic transformations (especially the negative and question transformations or sentence patterns). The possibilities are rich and varied, but teachers must take a very analytical approach to the language to be used in each planned lesson if they hope to be successful at teaching all the grammatical structures that are potentially available for instruction. This may not be easy, especially for content-area teachers with little training in linguistic analysis.
- iii) **Discourse Features.** As explained in Chapter 1, these can include specific rhetorical patterns common in academic work (e.g., paragraph and essay structure; experiment report format) as well as discourse markers typical of academic writing (e.g., *although, nevertheless, therefore*) and "theme-rheme" structure.

(2) **Functions.** Academic language functions ("ALFs") were explained in considerable detail in Section 3.3.2 of Chapter 1. We take it as obvious that one of the major objectives of content-area instruction should be to teach students how to accomplish the many language-related functions that are characteristic of academic work -- defining, hypothesizing, contrasting, expressing cause and effect, etc. (typical microfunctions) as well as explaining, describing, reporting, summarizing, etc. (typical macrofunctions). Every lesson should include opportunities for students to practise some of these functions. In addition, as emphasized in Chapter 1, direct instruction about ALFs should often be provided.

(3) **Skills.** Opportunities for developing the four language skills of listening, speaking, reading, and writing can generally be included in every lesson. Teachers should make an effort to be as specific as possible about the specific aspect of each skill that they want their students to practise. As explained in Section 3.3.2 of Chapter 1, each of the four academic language "skills" can be broken down into a variety of subskills. Since each content area makes its own special demands regarding which aspects of the four skills are important, teachers should make an effort to provide practice in those subskills which are relevant to their fields. For example, reading for pleasure may be important in literature study, but reading for specific information is generally more common in science and social studies.

(f) **The sixth step** is to examine the content and the language of the lesson, in order to identify which learning strategies may be taught through the planned learning activities. These strategies should be stated, in very specific terms, in the "objectives" section of the lesson. The teacher must identify where and how these learning strategies will be used and applied during the course of the actual lesson. We are convinced, however, that "incidental" strategy instruction is not enough. Students need to be taught, on a *conscious* and *explicit* level, what these strategies are and how to use them. Following Chamot and O'Malley, we call this "direct strategy instruction." Some examples of such direct instruction will be given in subsequent chapters, but a few general comments about the teaching of learning strategies are in order at this point.

We consider the learning strategies as an essential aspect of instruction for both the classroom teacher and the ESL teacher. They are, admittedly, not the focus of any lesson. The content is the focus for the classroom teacher, while the language is the focus for the ESL teacher. The mastering of learning strategies, however, is a crucial step that students must take if they are ultimately to take control of their own learning and become autonomous, independent learners. For this reason, learning strategies should be an essential component of every lesson.

In order to teach the learning strategies, the color-coded strategy sheets developed by Chamot and O'Malley (included as appendices to Chapter 1) are required. It must be emphasized, however, that all three sheets are **not** taught simultaneously. Such an instructional practice would be disastrous, as students would be thoroughly bewildered if they were given all the strategies at once. Logically enough, the sheets should be introduced one by one, beginning with the cognitive strategies (on the green sheet). The students should be given the sheet and instructed to keep it at the front of their binder as a reference source. The teacher should make continuous reference to the sheet during the course of each lesson. All the cognitive strategies on the green sheet should not be explained at one time, of course. They will be introduced one by one, and as the unit progresses they will be practised over and over again. The teacher should make a deliberate effort to incorporate as many of them as possible into every lesson. Once the students are fairly familiar with these cognitive learning strategies, the social-affective strategies (on the pink sheet) should be introduced. These strategies are fairly easy to understand. After they have become familiar to the students, the metacognitive learning strategies (on the blue sheet) can be introduced, and subsequently learned, one by one.

These color-coded learning strategy sheets should be placed in students' binders in the following order:

BLUE -- metacognitive
GREEN -- cognitive
PINK -- social-affective

They should always be readily accessible for reference, as these learning strategies are constantly discussed and "hammered home" in every lesson.

Summary of Steps:

To summarize, the steps for planning and developing a lesson are as follows:

1. Choose the topic or theme. (This determines the content.)
2. Select the appropriate materials.
3. Determine the content objectives.
4. Write the lesson plan (content objectives, procedures).
5. Identify the language objectives that suit the content.
6. Identify the learning strategies that can be taught and/or practised in the lesson.

By following these six steps, teachers can provide their students with opportunities to manipulate the content, learn academic language, and practise learning strategies. These will, in turn, give them the power to facilitate their own learning. Good teachers should be able to "foresee" any difficulties the students are likely to encounter, and will therefore know what must be done to overcome these difficulties before the learning activities take place. In doing so, they will be "setting the students up for success."

2. Procedures: The Five Phases of a Foresee Lesson.

Although exceptions are certainly possible, most Foresee lessons should follow the 5-stage format outlined in Chapter 1. This scheme, as the reader may recall, is taken directly from Chamot & O'Malley (1986; see the References at the end of Chapter 1 for sources cited in this chapter). It is well suited to the delivery of optimal instruction and practice in learning strategies, and also provides an excellent pattern for teaching content and language. The reader would be well advised at this point to review the information in Section 3.4 of Chapter 1, entitled "Implementing CALLA: An Introduction."

Chamot and O'Malley (1986) refer to the five phases (stages) of a lesson as the "five organizing principles" for sequencing a lesson's activities. These five stages or organizing principles, as described in Chapter 1, are:

a) Preparation
b) Presentation
c) Practice
d) Evaluation
e) Follow-up (Expansion)

To expand slightly on the information given in Chapter 1, and to refresh the reader's memory, we here cite Chamot and O'Malley's summary of a typical CALLA lesson (1986:22; emphasis added).

> **Use five organizing principles to sequence the lesson's activities.** These five organizing principles are: preparation, presentation, practice, evaluation, and follow-up. During the **preparation** phase, the teacher gets the students ready for the lesson by helping them focus on the topic. This can be done by means of a brainstorming session in which the students contribute all the information that they already know about the topic to be studied. Next, the teacher gives the **presentation** of new material -- either by explaining it, having students read it, showing a film or playing a tape. The new material must then immediately be **practised** by the students so that they can actively manipulate both the concepts presented and the language skills needed to understand and express the new information. After students have had an opportunity to practise using the new materials in a meaningful way, an **evaluation** of their understanding of the lesson should take place. This evaluation can be teacher initiated, it can be a cooperative peer process, or it can be a self-evaluation. Often the evaluation is built into the practice part of the lesson, so that students are constantly checking as they work on new problems. Finally, the teacher should plan for a **follow-up** activity that provides students with an opportunity to integrate the new concepts and skills acquired in the lesson into their existing knowledge framework.

This scheme allows a very *balanced* instructional format, in that the first two phases (preparation and presentation) tend to be "teacher-directed" while the last three (practice, evaluation, and follow-up) are generally "student-centred." (Note: These two terms are taken from Chamot & O'Malley, 1989). Good teaching in the two teacher-orchestrated stages will empower students, setting them up for success in subsequent phases where they can take control of their own learning.

Needless to say, there is nothing especially new or original about this format. Surely all good teachers make a point of activating background knowledge before presenting new material to be learned. They also provide opportunities for practice, self-evaluation, and follow-up as a way of ensuring that students assimilate the material, reflect upon their success in having learned it, and extend their knowledge into other areas. What is unique to CALLA, and especially to the Foresee Approach, is that the five stages or phases of a lesson are all conceived and exploited as separate contexts for the development of language skills and for the teaching and practice of learning strategies. Unfortunately, it is very difficult to explain exactly how this procedure can be planned, much less accomplished, without making reference to actual examples of Foresee lesson plans. We hope that the examples in subsequent chapters will succeed in clarifying the planning process for teachers who wish to implement our approach.

3. Foresee Techniques.

We conclude this discussion of lesson procedures with a separate section on Foresee techniques. One significant difference between CALLA and Foresee is that Foresee application often involves the utilization of certain special **techniques** or **procedures** that have not yet been incorporated quite so deliberately nor explictly into CALLA methodology. The Foresee Approach places far greater *specific* emphasis than CALLA on the level of **technique**. As explained in Kidd & Marquardson (1992), Chamot & O'Malley (1986) have included some excellent techniques in their sample lesson plans, but they have not focused specifically upon them. We hope it will be evident to teachers who read our lesson plans carefully that Foresee has the merit of being clear and explicit about the "**how**" of classroom application. Most of the techniques used in the sample lessons below can be easily adapted to suit the needs of any teacher willing to make the effort to implement the Foresee Approach in his or her classroom, either ESL or mainstream.

In order to illustrate our notion of useful Foresee techniques, and also to give the reader a few of these to adapt to his or her own purposes, we describe three such techniques below. We begin with two that have been extracted from the sample lesson plans in Chamot & O'Malley (1986). Then we explain in more detail an original Foresee technique for teaching textual material in any content area. The following descriptions have been excerpted verbatim from Kidd & Marquardson (1992).

3.1 The Dictated Instructions Technique

Many lessons in various subject areas involve teachers giving instructions to students about some activity to be performed. In science classes, for example, teachers typically instruct students about the sequence of operations in an experiment, prior to having the students perform the experiment themselves. Typically, such instructions are written on the chalkboard or overhead transparency for students to copy, or photocopied instructions are distributed to all. In their Sample Science Lesson 1, Chamot and O'Malley (1986) utilize an interesting technique for instructing students about the steps of an experiment. This procedure, which we call the "Dictated Instructions Technique," promotes the development of a number of language skills and learning strategies which would receive no attention in conventional instruction. Among these are listening comprehension skills, note-taking skills, and the learning strategies of selective attention, cooperation, and questioning for clarification.

The procedure works as follows. In the presentation phase, the teacher dictates the instructions to the students, making sure to include in the passage a variety of discourse cues that will help them follow the sequence of steps. The students copy these instructions as best they can, abbreviating where necessary as in typical note-taking. Then, in the practice stage, students are divided into small groups. The members of each group have to compare the notes they have taken, pool their information, and prepare a master procedure card that is likely to be fairly accurate. The teacher makes a point of remaining available to answer questions for clarification. When the master list of steps is complete, each group goes ahead and performs the target activity.

In the case of Chamot and O'Malley's science lesson, this target activity is an experiment on the erosion of rocks by water. Notice, however, that the general procedure of dictating instructions can be explained and understood without reference to any specific topic. It is just the sort of straightforward, adaptable technique that teachers appreciate, since they can apply it quite easily to the instruction of a host of content-area topics. This is not to say that the detailed lesson plan presented by Chamot and O'Malley is without value. Their plan demonstrates nicely how this general procedure can be fit into a five-stage CALLA lesson, and includes descriptions of related activities (e.g., completing an observation journal) that "fill out" the lesson. But notwithstanding these merits, we maintain that the real kernel of the lesson is the Dictated Instructions Technique. It is easy enough to understand, and once teachers become aware of it, they can apply it in a virtually unlimited number of situations. This is the virtue of a general procedure.

3.2 The T-List Procedure

This procedure is explained in Chamot and O'Malley's (1986) Sample Social Studies Lesson 2. As in the case of the technique above, the purpose of this procedure is to improve students' listening comprehension skills and provide practice in using the learning strategy of selective attention. The teacher explains to students that they are going to hear a short lecture on a particular topic (in this case, the American Indian chief Massasoit). The lecture, they are told, will contain a number of discourse markers that will give clues as to the sequence of ideas, whether pieces of information are main ideas or supporting details, etc. When the passage is dictated (or a tape is played), the students make notes on a "T-list." This is simply a page with a vertical line down the middle, sometimes with certain information already on it. On the left side, the students note the "main ideas" of the text. On the right, they write "details and examples" (i.e., supporting information) beside the corresponding main ideas. Through this exercise, the students gain skill at identifying main and subordinate ideas by attending to discourse cues of various sorts. The first few times the procedure is used, the T-lists provided to students may contain a good deal of information already on them, so students need only fill in the missing information. As they develop more skill at note-taking, they can eventually fill in their T-lists without such assistance.

The T-List Procedure is obviously a quite general technique that can be applied with many texts. Again, Chamot and O'Malley's lesson plan is instructive regarding related activities, how the technique fits into a five-stage lesson, etc. But as before, the value of the procedure lies in its simplicity and, above all, flexibility. Let us consider now one final example of an effective CALLA procedure, an original technique developed by Marquardson. It has been used successfully for the instruction of ESL students at the grades 3-6 level, and is adaptable enough for application at any level.

3.3 The Text Questioning Technique

This technique is particularly useful for introductory lessons on curricular topics or themes. Because no published materials currently exist to illustrate its use in a CALLA lesson, we shall describe it according to the five-stage format. Information is also included about some the key learning strategies and language aspects practised during the different phases. The following abbreviations will be used for strategy types: MC = metacognitive, C = cognitive, and SA = social-affective.

As a preliminary planning step, the teacher chooses from the students' textbook a reasonably short but informative reading passage on the target topic, making sure that this selection is accompanied by a title and as many of the following as possible: subheadings, pictures, diagrams, charts, or any other visual supports. The teacher also prepares a comprehensive list of WH-questions on the content of the passage.

A. **Preparation** (Brainstorming)

The teacher tells the students to **open** their books to the reading passage. They have one minute to look at the title and accompanying visual supports, and must try to guess or predict what the passage is about. (Strategies practised: MC - *advance organization*; C - *inferencing, imagery*.) After one minute , the students are told to **close** their books and to write down in a few words what they think the passage is about. (Spelling and sentence structure are not important at this time.) The teacher then listens to each student's prediction, writing the key vocabulary items on the chalkboard (or transparency). Then the students **open** their books again, and the teacher orchestrates a further discussion of the title, pictures, diagrams, etc. If necessary, pointed questions can be asked to elicit important vocabulary items that have not yet been mentioned. If the questioning is thorough and properly executed, the students will have all the necessary vocabulary in front of them, and they will know what the whole passage is about before it is read. (Strategies practised: MC - *selective attention, organizational planning*; C - *inferencing, imagery, resourcing*.)

B. **Presentation** (Listening)

The teacher tells the students to **close** their books and read the numbered list of WH-questions just uncovered on the board (or shown on the overhead). After silent reading is completed, the teacher reads the questions aloud one by one, reviewing any vocabulary the students do not understand. Then the students are instructed to write the question ***numbers*** (*not* the questions) down the left side of their notepapers, in preparation for notetaking. After this is done, the teacher reads the passage aloud, fairly slowly, and the students listen carefully for answers to the questions on the board, writing these answers down in short form (one or two words, abbreviations, or numbers) beside the corresponding numbers on their papers. Finally, the teacher reads the passage again once or twice, more rapidly, allowing the students the opportunity to complete their lists or to check their answers. (Strategies practised: C - *notetaking*; MC - *self-monitoring*).

C. **Practice** (Speaking and Reading)

Books **open**, students work in pairs, comparing their answers and checking them against the text. At this point they should ensure that their answers are spelled correctly and that all abbreviations are expanded. A set time limit (e.g., 10 minutes) should be assigned for this task. The teacher should circulate during this phase, providing input and assistance when requested. (Strategies practised: MC - *self-evaluation*; SA - *cooperation, questioning for clarification*.)

D. **Evaluation** (Speaking)

The books are **closed**, and the teacher asks individual students to contribute their answers to the questions on the board (or transparency). The teacher writes the correct responses beside the corresponding questions in a different color (chalk or felt pen). The students should correct their errors at this point.

E. **Follow-up** (Writing)

Books remain **closed**. The students are instructed to finish the activity individually by now writing the answers in complete sentences. The teacher demonstrates how to write proper declarative sentences by using (a) most of the words in the WH-questions, and (b) the answers on the board. Phrases can be underlined and arrows drawn to show how this is done. Different colors should be used for maximum effect. (Note: What the teacher is really demonstrating here is a set of transformations used for changing WH-questions to statements. Many other structures can also be practised at this stage, depending on the topic.) After the answers have been completed, students help their partners by editing their work. When students think their answers are correct, they present their papers to the teacher and -- if time allows -- read some of their answers aloud, editing their work with the teacher as they are reading. (Strategies practised: MC - *self-evaluation*; C - *deduction/induction*; SA - *cooperation*.) Further follow-up activities may then be initiated, including individual research projects on particular aspects of the reading passage.

The general procedure described above has the paramount virtue of being extremely flexible. It can be employed in any subject area and for any topic, provided that a suitable reading passage can be found. Although its use has so far been restricted to the grades 3-6 level, there seems no reason why it should not be effective with older students. It can be used with ESL-only groups or, more significantly from the viewpoint of this paper, with mixed classes containing both ESL students and native speakers of English. It is straightforward and relatively easy to implement. Finally, it accommodates well to the five-stage lesson format recommended by Chamot and O'Malley, offering the teacher a systematic and adaptable scheme for developing language skills and learning strategies through content-area work.

4. Unit Development.

Foresee application generally follows a **theme-based approach** of the type discussed in a variety of sources concerned with either elementary-level education in general (e.g., Gamberg et al., 1988), ESL education in particular (e.g., Brinton, Snow, & Wesche, 1989), or a combination of both (e.g., Enright & McCloskey, 1988). We make no claims to originality in this regard, and indeed, we recognize that most elementary teachers probably use theme-based instruction a good deal of the time. Nonetheless, the way in which we structure theme-based units to fulfil the aims of Foresee instruction (teaching language, learning strategies, etc.) is perhaps somewhat different from previous applications along these lines.

Once the topic or theme is chosen and the materials are being selected, the unit will begin to develop and evolve. Supportive materials are vital for the successful development of any unit. If the materials are insufficient or inadequate, there will be nothing to base the learning activities around. When searching for supportive materials, teachers should select exciting resources which will promote stimulating lesson plans. These materials will provide a progression or sequence for successive lessons. In other words, one lesson will lead into another -- each lesson will be dependent upon and build upon the lesson before.

Foresee units tend to be highly **integrated** in terms of content areas. Many different subject areas can usually be incorporated into, and taught via, any unit. This is especially true at the elementary level, and even more so in the ESL setting. Usually science and mathematics, or social studies and mathematics, can be integrated within a given unit. Language arts can generally be made an integral part of every lesson and every unit.

As a unit develops, the teacher will usually find that a pattern will emerge. At this point, a summary of the unit can be made. Three such summaries are included in the introductions to Chapters 4, 5, and 6, to illustrate the units contained in those chapters. These summaries help the teacher to stay on task and maintain a desirable direction for the unit.

Nothing more needs to be said at this point about the structure of Foresee units. The three sample units in the following chapters will serve to elucidate the process of unit construction far better than any summary description we might attempt here. The reader is advised to study those sample units very carefully and to take special note of the sequential organization of lessons, their variety, and their dependence upon materials.

To conclude, the synthesis of theory and materials inherent in the Foresee Approach terminates in the reality of effective classroom instruction. Materials provide the concrete resources, while theory generates the objectives; together, these allow teachers to create innovative lessons and units. The positive and exciting learning environments that result are vital in ensuring the success of our classroom practices and -- ultimately -- of our students as they aspire to higher academic goals.

Chapter 4

Advanced Unit: Planets and Space

Chapter 4

Advanced Unit: Planets and Space

This unit was originally used for the instruction of an advanced group of ESL students in grades 4-6, in a pullout situation. These students were already familiar with the learning strategies, so the instruction of these strategies was conducted on an advanced level; see Chapters 5 and 6 for information about how to teach learning strategies at lower levels.

The unit has been designed to incorporate three related topics: **the planets and the solar system**, **Roberta Bondar on the Discovery Space Shuttle**, and **the space race**. All four academic areas of science, language arts, mathematics and history have been integrated into this unit.

The three related topics have been developed within this unit to accommodate for flexibility to the particular situations of other teachers. The unit may be concluded at three different points:

1. After planets - Lesson 5.
2. After Roberta Bondar and the Discovery - Lesson 10.
3. After the space race - Lesson 12.

Learning logs have been included at the end of each topic for the students' self-evaluation. Students can check off the items they recall on each log.

Because the teaching of **learning strategies** is so important in the Foresee Approach, we have followed some special layout conventions to help the reader recognize these strategies wherever they occur in the text.

1. The names of the strategies are usually italicized and placed in square brackets, e.g., *[Self-evaluation]*, *[Resourcing]*.
2. **Metacognitive strategies** are generally listed on the **left** side of the page, **cognitive strategies** are listed in the **middle** of the page, and **social-affective** strategies are placed on the **right** side of the page. Example:

[Self-Evaluation] *[Grouping]* *[Cooperation]*
[Resourcing]

3. Whenever the teaching of a strategy in some way or other is **about to be explained** (that is, the explanation will appear below), a pair of hyphens follows the strategy. Example:

   [Resourcing]--

   This means that the teaching of this strategy is about to be discussed, or that the following activity will include this strategy.

   In contrast, when no hyphens occur after a strategy, this generally means that the use of the strategy has occurred in the **previous** activity, discussion, or whatever. Example:

   [Resourcing]

   This means that resourcing has been used in the activity that has just been explained.

Note: A full appreciation of the lessons in Chapters 4, 5, and 6 depends heavily on the reader's understanding of all the **learning strategies** discussed in Chapter 1 (see pages 31-35). A detailed review of these strategies is therefore recommended as an extremely useful preparation for these chapters. For a special explanation of the cognitive strategy of *[Deduction/Induction]*, see p. 87 below.

Summary of Lessons: Planets and Space

- An advanced unit integrating language arts, science, mathematics and history.

1. Introductory Lesson
    - note taking --> sentences
2. Planets
    - Activities integrating comparatives, superlatives and prepositions.
3. Planet math problems
    - Solving math word problems about planets.
4. Planet Research
    - Using library resources to write a report.
5. Planet Presentations
    - Writing summaries from a presentation.

[Learning Log]

6. The Discovery: Introductory Lesson
    - Writing a descriptive paragraph from a television broadcast.
7. The Discovery: Roberta Bondar
    - Writing a report from a newspaper article using teacher made questions as a guide.
8. Individual newspaper articles about Roberta Bondar
    - Writing a multi-paragraph report from a newspaper article using a T-list.
9. Roberta Bondar Presentations and Predictions from newspaper articles
    - hypothesizing and predicting to write summaries.
10. The Dream is Alive
    - Note taking from a video.

[Learning Log]

11. The Space Race
    - Writing a summary in point form answering "wh" questions.
12. The Space Race Time Line
    - Summarizing in the form of a brief paragraph.

[Learning Log]

Lesson 1: Introductory Lesson on the Solar System

Objectives:

Content Objectives:

- To learn about the planets in the Solar System.

Language Objectives:

Skills:

- Listening - to note take, in group discussions.
- Speaking - to compare and correct answers, in group discussions.
- Reading - for specific information to verify their answers.
- Writing - to complete declarative sentences.

Linguistic Knowledge:

Vocabulary Development:

- planets, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, Solar System, sun, star, orbit, revolve, round, circle, sphere, measure, year, rocket

Structures:

- proper nouns, including capitalization
- punctuation
- subject-verb agreement
- present tense for scientific truths
- declarative sentence form
- adverbial clauses of reason
- comparatives and superlatives

Discourse Features:

- Theme - rheme structures

Functions:

- Reporting factual information by writing declarative sentences (derived from questions).
- Defining

UNIT 10

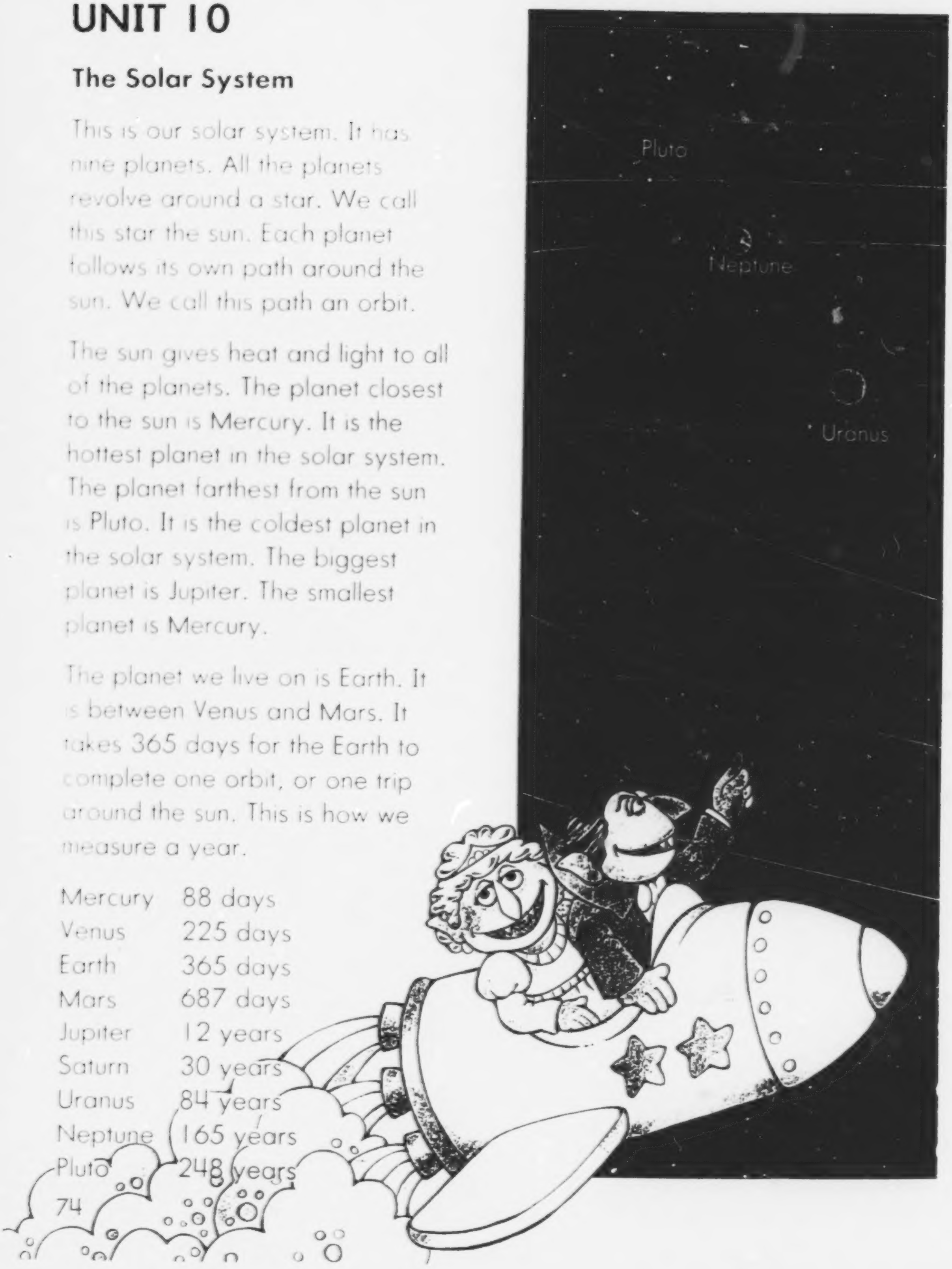
The Solar System

This is our solar system. It has nine planets. All the planets revolve around a star. We call this star the sun. Each planet follows its own path around the sun. We call this path an orbit.

The sun gives heat and light to all of the planets. The planet closest to the sun is Mercury. It is the hottest planet in the solar system. The planet farthest from the sun is Pluto. It is the coldest planet in the solar system. The biggest planet is Jupiter. The smallest planet is Mercury.

The planet we live on is Earth. It is between Venus and Mars. It takes 365 days for the Earth to complete one orbit, or one trip around the sun. This is how we measure a year.

Mercury	88 days
Venus	225 days
Earth	365 days
Mars	687 days
Jupiter	12 years
Saturn	30 years
Uranus	84 years
Neptune	165 years
Pluto	248 years



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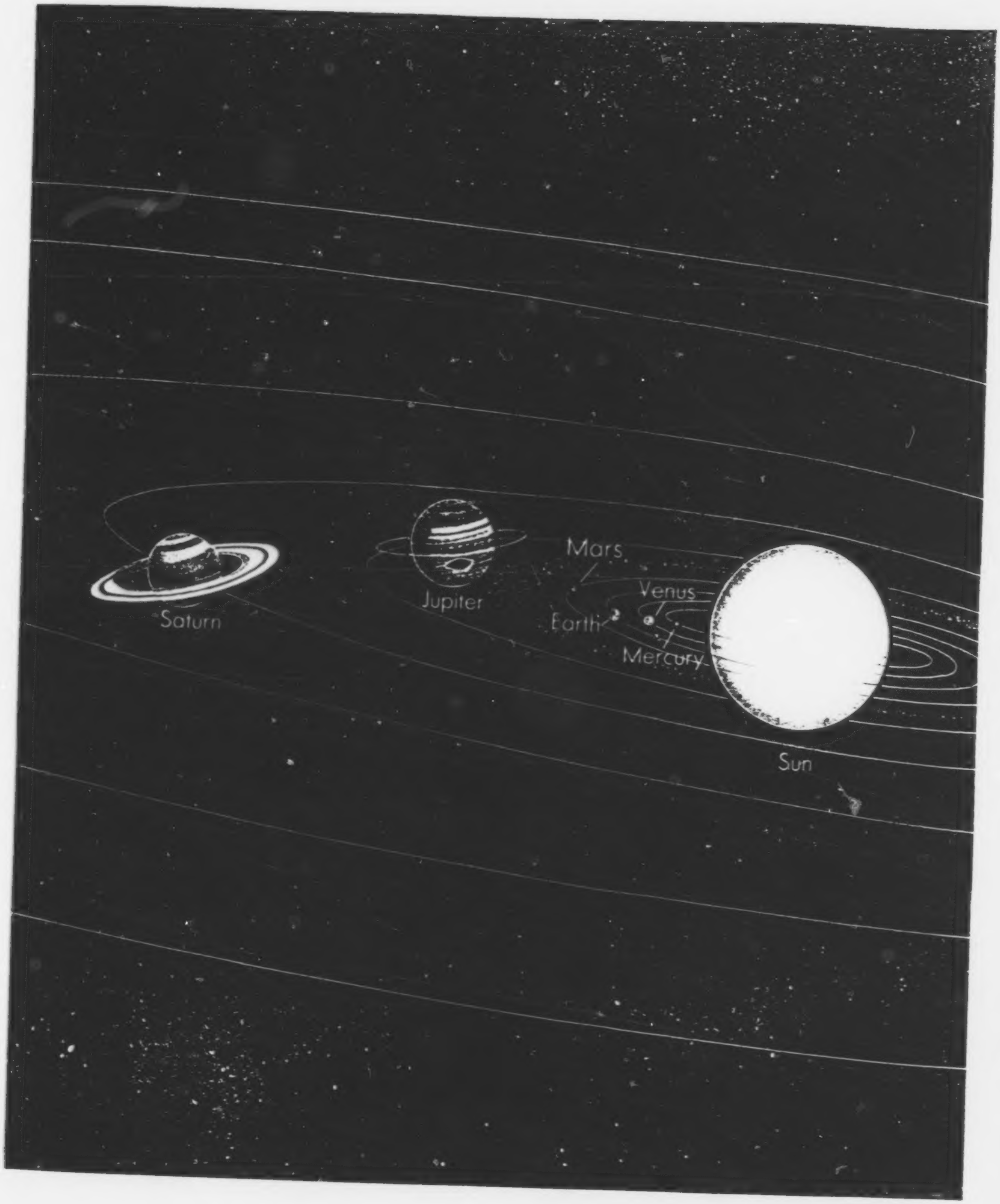
Saturn
Jupiter
Mars
Venus
Earth
Mercury
Sun

From *Open Sesame, Stage D: Prairie Dawn's Purple Book*, pp. 74-75.

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Learning Strategies:

Metacognitive Strategies:

- Advance organization
- Selective attention
- Organizational planning
- Self-monitoring
- Self-evaluation

Cognitive Strategies:

- Prediction
- Inferencing
- Note Taking
- Deduction/induction
- Imagery
- Resourcing
- Auditory representation

Social-Affective Strategies:

- Cooperation
- Questioning for clarification

Materials:

- Any reference book with good visuals and an article about planets.
- An excellent resource for this introductory lesson is *Open Sesame, Stage D: Prairie Dawn's Purple Book*, pages 74-75.

Procedures:

I. **PREPARATION - Brainstorming**

Note: Steps 1, 2, & 3 below are in *Addison Wesley ESL, Level D: Teacher's Edition*, p. 14.

1. Tell the students to **OPEN** their books to pages 74-75 (*Open Sesame Stage D - Prairie Dawn's Purple Book*). They are told they have one minute to look at the title, headings (if any), chart and pictures to guess or predict what they think the article is about.

[Advance Organization] *[Prediction/Inferencing]*
[Imagery]

2. After one minute, tell the students to **CLOSE** their books and to write down in a few words what they think the article is about. Spelling and sentence structure (syntax)

are not important at this time.

3. Listen to each student's prediction. Write the key words (vocabulary) on the board or transparency. e.g. solar system, planets, sun, stars, moons, rocket.

Strategy Instruction: Developmental Questions

[Advance Organization]-- (Metacognitive; not listed on the blue sheet)

- How did you know what the article was going to be about?
- How did you get "Solar System"? (title)
- How did you get "planets"? (listed at the bottom of the page).
- Would you say that looking at the article in advance before you read it helps you to organize your thoughts?
- Does this help you to plan what you would learn?
- Could we call this advance organization?
- If it helps you plan what you will learn, what strategy sheet would you add advance organization to? (blue one)
- Let's add it. Where should we put it? (Before "PLAN what I will do".)

[Imagery]--

- How did you get the words "sun" and "stars"? (from the picture)
- How did you get the word "rocket"? (from the picture)
- Does the picture help you?
- How?
- What strategy are you using when you look at the pictures for information? (using images and pictures)

4. Tell the students to **OPEN** their books and discuss the title, chart and picture. Ask questions to elicit more vocabulary and brainstorm. Write the vocabulary on the board or transparency (these words are left on the board to aid the students when they are note taking during the presentation).

Ask:

- How many planets are there?
  9 planets. Name them.
  - Mercury
  - Venus
  - Earth
  - Mars
  - Jupiter
  - Saturn
  - Uranus
  - Neptune
  - Pluto

- Why do all the planets start with capital letters? (proper nouns)

- What shape are all the planets? (round, circle, sphere)
- Which planet is the biggest? (Jupiter)
- Which planet is the smallest? (Pluto)
- Which planet is closest to the sun? (Mercury)
- Which planet is farthest from the sun? (Pluto)
- Which planets have rings around them? (Saturn, Uranus)
- Which planet do we live on? (Earth)
- Where is Earth in the Solar System? (third planet, between Venus and Mars)
- In the picture, what is drawn around the sun? (lines)
- Why are there lines around the sun? (planets go around the sun)
- What are these lines called? (orbits)
- Do all the planets go around the sun? (yes)
- Why is the page black? (dark)
- What lights up the world? (sun)
- When does the sun shine? (day)
- When is it dark? (night)
- Look at the people, what are they in? (rocket)
- How do you know it is a rocket and not an airplane? (answers will vary)
- Where are they going? (answers will vary)
- What do you think the chart at the bottom of the page lists?

The students have all the information and know what the whole article is about before it is read.

The words from the Preparation or brainstorming session are left on the board or transparency during the Presentation of the lesson (to aid the students).

[Selective Attention]
[Organizational Planning]
[Prediction/Inferencing]
[Imagery]
[Resourcing]

II. PRESENTATION - Listening

5. A. Tell the students to **CLOSE** their books and to read the questions silently to themselves. (The questions are on the board or transparency. See the **end of this lesson** for the list of questions.)

   B. The teacher reads the questions aloud, reviewing all vocabulary the students do not understand. With the students' assistance, the teacher underlines -- in each question -- the most important word that the students will be listening for during note taking.

6. The students number their papers #1-14 to prepare for note taking.

7. The teacher reads the story fairly slowly. The students listen carefully for the answers and write down the answers to the questions (numbers, or one or two words or letters) as they hear them, beside the appropriate numbers. Spelling is not important at this time.

[Note Taking]

8. The teacher rereads the story or article more rapidly, allowing the students the opportunity to complete the activity or to check their answers.

If necessary, reread the article once more.

[Self-Monitoring]

III. PRACTICE - Speaking and Reading

9. Assign each student to a partner. They work in pairs, discussing and comparing their answers. (See *Addison Wesley ESL, Level D - Teachers' Edition*, p. 39.)

   Instruct the students to **OPEN** their books to correct:
   a) Answers
      - by comparing their answers with their partners' and to verify them with the article.
   b) Spelling
      - check for the correct spelling of their answers.
   Assign a set time limit, e.g.,10 minutes for the task.

   The students compare and correct together while the teacher circulates to give input and assist when needed.

[Self-Evaluation]

[Cooperation]
[Questioning
for Clarification]

IV. EVALUATION

10. Tell the students to **CLOSE** their books. Together the teacher and the students correct the questions on the board or transparency. The teacher reads the question and the students (not the teacher) supply the correct responses. This empowers the students.

    The teacher writes the answers in a different color chalk or felt pen to draw visual attention to the answers. E.g., How many planets are in the solar system? *9.* (Question and answer in different colors.)

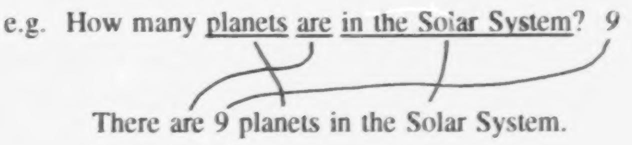
V. FOLLOW-UP - Writing

11. Books remain **CLOSED**. The students are instructed to complete the exercise individually, this time writing the answers in **complete sentences**. At this point the teacher teaches them how to write a complete sentence using most of the words in the question and the answers on the board or transparency.

[Deduction/Induction]--

Ask:

- What words are you going to use from the question for your answer? Underline them.



e.g. How many planets are in the Solar System? 9

There are 9 planets in the Solar System.

Proper nouns:

- When the students are doing question #2. Ask:
- When you are writing the names of the planets what do you have to use? (capital letters)
- Why?
- What is the name for particular things? (proper noun)
- What is a proper noun?
- Will you have a few or many proper nouns on this page?

Adverbial Clauses of reason:

- Look at questions 7 and 8.
- How many parts are there to those questions? (2)
- How do you know? (A and B)
- When you are writing your answers, how many sentences will you write?
- Could you write each in one sentence?
- How?
- What word did you use to connect or combine the two sentences? (because)
- Could you use "because" in both sentences?

You are also integrating:

- Subject verb agreement.

Ask:

- When do you use "is" in a sentence?
- When do you use "are"?
- What rule could we make up?

    is = 1
    are = 2+

- Comparative and superlatives are integrated into the questions and answers. They will be used more extensively in the next lesson.

Note: In answering the questions, students are gaining experience in using the **theme-rheme** format of information organization so common in English discourse. The **theme** of a sentence is what is being talked about, while the **rheme** is the information given about the theme. Thus, in writing an answer like *The sun is a star*, for example, the students are practising theme-rheme discourse organization; *the sun* is the theme, *is a star* is the rheme. Generally, the theme of a sentence is old or "given" information, whereas the rheme represents "new" information.

12. Each student edits his/her partner's work before showing it to the teacher.

[Cooperation]

13. The final draft is edited as it is read to the teacher.

[Self-Evaluation]

Questions

Taken from *Open Sesame Stage D - Prairie Dawn's Purple Book, Teacher's Book*, p. 74-75.

Answers are given in italics; use a different color during instruction (see above).

1. How many planets are in the Solar System? *9*
2. What are the names of the planets? *Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Nepture, and Pluto.*
3. What is the word that means to move around the sun? *revolve.*
4. Is the sun a star or a planet? *star.*
5. What is the name of the path a planet takes? *orbit.*
6. What do the planets get from the sun? *heat and light.*
7. A. Which planet is the hottest? *Mercury.*
   B. Why? *closest to the sun.*
8. A. Which planet is the coldest? *Pluto.*
   B. Why? *farthest from the sun.*
9. Which planet is the biggest? *Jupiter.*
10. Which planet is the smallest? *Mercury*
11. Which planet do we live on? *Earth.*
12. Where is the planet we live on? *between Venus and Mars.*
13. How many days does it take for Earth to complete one trip around the sun? *365.*
14. How do we measure a year? *1 orbit.*

Lesson 2: Planets (Science)

Objectives:

Content Objectives:

- To learn about planet orbits and their relationship to the concept of "year."
- To learn the relative distances of the planets from the sun.
- To learn how the Earth's rotation causes day and night.

Language Objectives:

Skills:

- Listening - in group activity
  - for directions
- Speaking - in the game
  - in group discussions
- Reading - to complete the activity sheet
  - to play the game
- Writing - selecting the appropriate word to complete the sentence.

Linguistic Knowledge:

Vocabulary:

- revolve, revolution, rotate, rotation, orbit, path, distance, between, next to, beside, farther, farthest, closer, closest, colder, coldest, hotter, hottest, longer, longest, distance, step, back, front, day, night, globe, axis, flashlight, select/selected/selective

Structures:

- Comparatives and superlatives.
- Prepositions.
- Past tense for completed actions.

Functions:

- Defining (e.g. An **orbit** is the path of a planet around the sun).

Learning Strategies:

Metacognitive Strategies:

- Advance organization
- Selective attention
- Organizational planning

- Self-monitoring
- Self-evaluation

Cognitive Strategies:

- Inferencing
- Imagery
- Deduction/induction

Social-Affective Strategies:

- Cooperation
- Questioning for clarification

Materials:

- *Open Sesame Stage D: Prairie Dawn's Purple Book - Activity Book,* Activities 39 and 42.

Procedures:

The activity done in the Presentation phase of this lesson was taken from *Open Sesame Stage D, Prairie Dawn's Purple Book - Teacher's Book,* page 74.

I. PREPARATION:

Look at a picture of the planets. Discuss:

- How many planets are there? (9)
- Where are the planets? (Solar System)
- Which planet is closest to the sun? (Mercury)
- Which planet is farthest from the sun? (Pluto)
- Which is the largest planet? (Jupiter)
- Which is the smallest planet? (Mercury)
- What is the sun? (a star)
- Where do the planets move? (around the sun)
- What is their path around the sun called? (an orbit)
- What is the word used for when a planet moves around the sun in the orbit? (revolve)
- The planets revolve around the sun in their orbits.
- What is the difference between "revolve" and "orbit"? (*orbit* is the path and is a noun. *Revolve* is the movement and is a verb).
- How do we measure a year? (completion of one orbit)
- Do the orbits ever cross each other? (no)
- Which planet has the shortest orbit? (Mercury)
- Why? (closest to the sun)
- Which planet has the longest orbit? (Pluto)
- Why? (farthest from the sun)
- Can you name all the planets starting with Mercury?

We are going to do an activity in which each one of you will be a planet and we will need one sun. We will do this activity in the multi-purpose room as we need a lot of room.

- Which planet would you like to be? (The students each choose a planet; one is the sun).
- Write the name of your planet on a piece of paper in large letters.

II. PRESENTATION:

In the multi-purpose room:

Ask:

- Where is the sun?
- Where will the sun stand? (in the middle of the room)
- Which planet is closest to the sun? (Mercury)
- Where will Mercury stand? (next to the sun)
- Which planet is next to Mercury? (Venus)
- Which planet is next to Venus? (Earth)

Do this until the students have assumed their positions as planets.

Ask:

- Which planet is between Venus and Mars? (Earth)
- Which planet is between Jupiter and Uranus? (Saturn)
- Which planet is between Uranus and Pluto? (Neptune)
- Which planet is between Mercury and Earth? (Venus)
- Which planet is between Mars and Saturn? (Jupiter)
- Where is Uranus? (between Saturn and Neptune)

[Self-Monitoring] *[Imagery]*

- Tell the students they will start their orbits and revolve around the sun as the sun calls out when to take a step. The students representing the planets are to count how many steps it takes to complete one orbit. This proceeds until Pluto has completed his/her orbit. The other planets keep rotating as they are waiting for Pluto to complete its orbit. The other planets keep track of:

  a) How many steps it took to complete one orbit.
  b) How many orbits they completed by the time Pluto completed one orbit.

[Self-Talk]

Ask:

- How many steps did it take for Mercury to revolve around the sun in one orbit? (e.g., 8 steps)
- How many revolutions did Mercury do altogether?

The discussion will proceed with each planet.

- What is an orbit? (path around the sun)
- What is a revolution? (complete movement around sun)
- How much time has passed when the Earth has travelled one orbit? (1 year)
- Is a year on Earth the same length as a year on Mars? on Jupiter? etc.?
- Which planet has the longest year? (Pluto)
- Which planet has the shortest year? (Mercury)
- How do we get day and night?
- Stand on the spot with the front of you facing me. It is day time. Now slowly turn 1/2 turn, what is facing me now? (our backs)
- Where is the front of you? (away from the sun)
- What time of day do you think it is now? (night)
- Turn 1/2 turn again. Keep going in the same direction. What are you facing now? (the sun)
- How much time has passed? (1 day)
- When you were turning on the spot what is that called? (rotate)
- How many rotations did you do?
- Let's revolve around the sun for 10 steps and rotate as we do it. Be careful don't get dizzy.
- We will discuss this more in the classroom.

When the students return to the classroom, get a globe and show them how the world rotates on its axis. Shut off the lights and, using a flashlight, show them how we get day and night.

[Selective Attention] *[Imagery]* *[Cooperation]*
[Advance Organization] *[Elaboration]*

Strategy Instruction:

[Imagery]--

- Did going to the multi-purpose room help you to understand about the planets?
- What did you learn?
- How did you learn it?
- By pretending to be planets will you remember the information?
- What strategy were you using when you were the the image of a planet? (imagery)
- How do images or pictures help you?

[Elaboration]--

- What did you learn yesterday?
- What have we learned today?
- What helped you to understand the new information today?
- What strategy is it when you used what you already know or your prior knowledge? (elaboration)

[Selective Attention]--

- As we were discussing the planets in the multi-purpose room, did you have to listen carefully?
- What did you listen for?
- When the sun said the key words, did you know what to do?
- Do you know what "select" means? (to choose; give example of buying things at the store)
- Do you think paying attention to selected words helps you learn? (Note: Explain how "selected" derives from "select.")
- Do you think this is a strategy?
- It isn't on any of the sheets but it could be. What sheet do you think we should put it on? (blue sheet)
- Why? (it helps me learn)
- Let's write down. SELECTIVE ATTENTION for key words. (Explain that "selective" means "wanting to select.")
- Where shall we put it? (after "PLAN what I will do.")

III. PRACTICE:

Distribute Activity 39 from *Open Sesame Stage D: Prairie Dawn's Purple Book - Activity Book*, or make a worksheet of comparative and superlatives. Have the planets and the sun drawn on the sheet so the students have the picture to help them with the activity.

Strategy Instructions:

[Organizational Planning]-- *[Imagery]--*

- Tell the students to label the planets before they start.
- Ask them why they have been asked to do this.
- What strategy are they using?

[Imagery]

e.g. Pluto is far from the sun than Mercury.
farther
farthest

[Self-Monitoring] *[Inferencing]*
[Deduction/Induction]

IV. EVALUATION:

- When the students have completed the worksheet, they are paired up, and partners correct each others' sheets.
- Each student reads his/her sheet to the teacher once he/she has corrected it.

[Self-Evaluation]

[Cooperation
[Questioning
for Clarification]

V. FOLLOW UP:

Activity 42 from *Open Sesame Stage D: Prairie Dawn's Purple Book - Activity Book.*

This is an excellent game to reinforce the activities done in this lesson with comparatives, superlatives and prepositions.

They play in groups of 3 with a die. One student has a picture of the Solar System and acts as a checker of answers. The other two play the game by rolling the die and naming the planet the box describes, e.g. "between Mars and Saturn." (answer: Jupiter). Students cannot advance if they give the wrong answer, as decided by the checker.

Special Note on the Cognitive Strategy of DEDUCTION/INDUCTION.

Chamot & O'Malley (1987) characterize this strategy as follows:

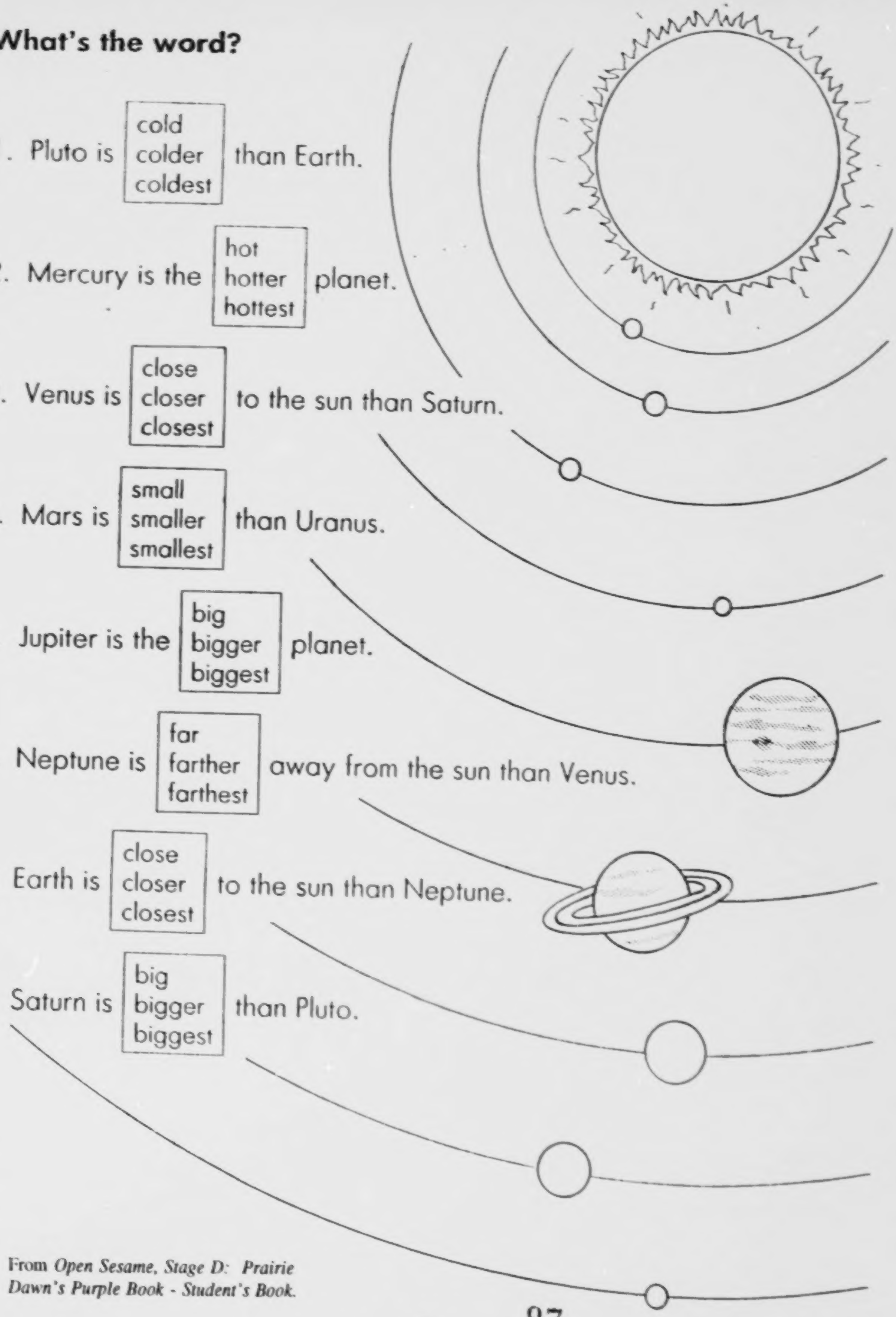
> Applying rules to understand or produce the second language, or making up rules based on language analysis.

This strategy pertains, then, to language learners' conscious attention to the **grammatical structures** of the target language, with particular emphasis on the use of **linguistic rules** to assist in the production or comprehension of structures. The deliberate application of a rule already known by the students is normally called the **deductive approach**, or simply **deduction**. The "making up" of rules on the basis of linguistic evidence, on the other hand, is called **induction**; students can often induce rules from the language samples they see and hear, *especially when they are given proper guidance in seeking out these rules.*

On the previous page, for example, the students were asked to choose between the alternative adjective forms "far - farther - farthest" in producing a correct sentence about Pluto. Their choice of the comparative form might be based upon grammatical knowledge acquired earlier in this lesson or in previous lessons (deduction). Alternatively, this example might be used by some of them as evidence for the formation of the rule by themselves (induction).

Throughout the remainder of this manual, then, mention of the strategy *[Deduction/Induction]* invariably pertains to the analysis of grammatical forms or structures, either deductively or inductively.

What's the word?

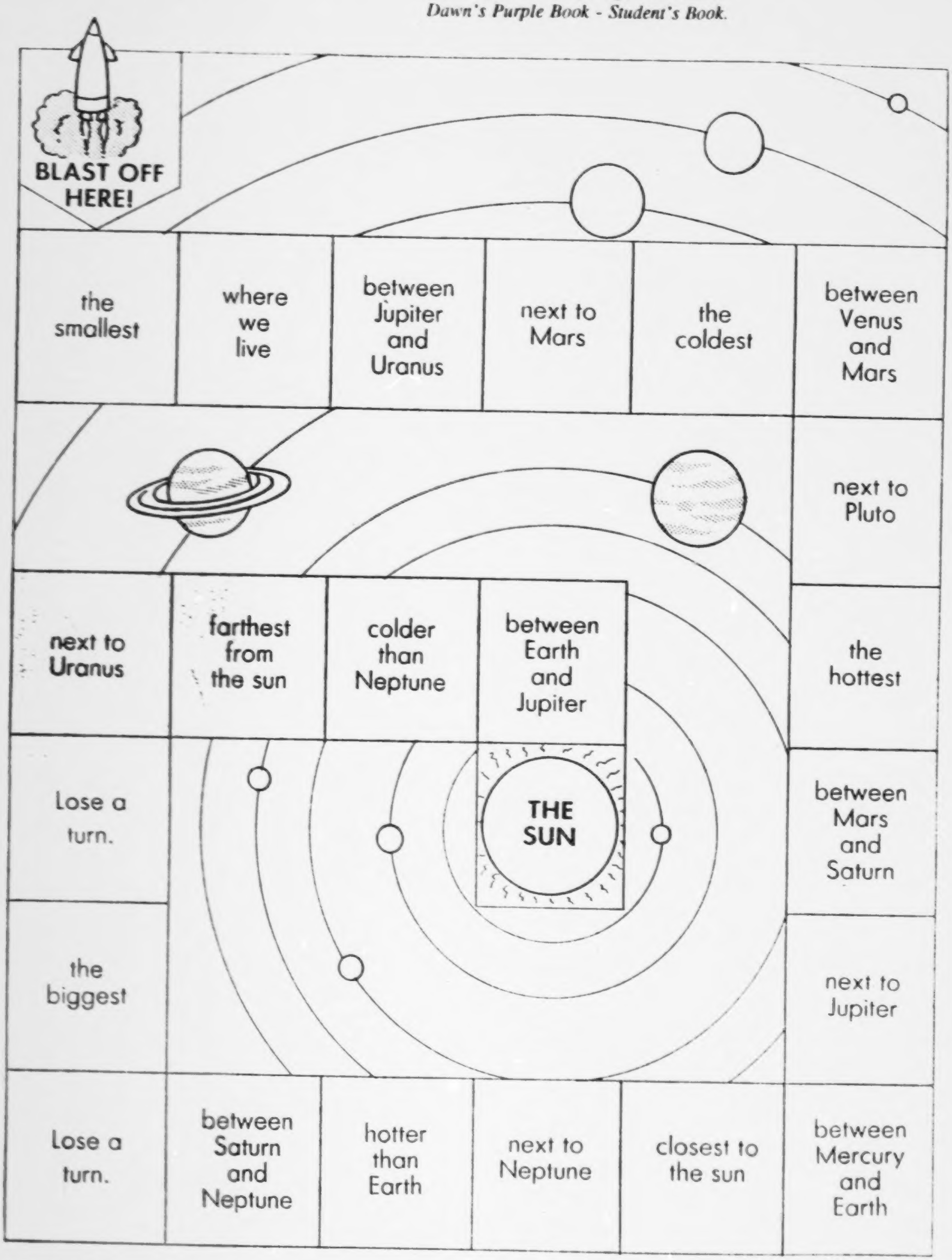


1. Pluto is	cold colder coldest	than Earth.
2. Mercury is the	hot hotter hottest	planet.
3. Venus is	close closer closest	to the sun than Saturn.
4. Mars is	small smaller smallest	than Uranus.
5. Jupiter is the	big bigger biggest	planet.
6. Neptune is	far farther farthest	away from the sun than Venus.
7. Earth is	close closer closest	to the sun than Neptune.
8. Saturn is	big bigger biggest	than Pluto.

From *Open Sesame, Stage D: Prairie Dawn's Purple Book - Student's Book.*

Name That Planet

From *Open Sesame, Stage D: Prairie Dawn's Purple Book - Student's Book.*


BLAST OFF HERE!
the smallest
where we live
between Jupiter and Uranus
next to Mars
the coldest
between Venus and Mars
next to Pluto
the hottest
between Mars and Saturn
next to Jupiter
between Mercury and Earth
closest to the sun
next to Neptune
hotter than Earth
between Saturn and Neptune
Lose a turn.
the biggest
Lose a turn.
next to Uranus
farthest from the sun
colder than Neptune
between Earth and Jupiter
THE SUN

ACTIVITY 42 Game: Name That Planet (See Game Directions in back of book.)

Lesson 3: Planet Problems (Mathematics)

Objectives:

Content Objectives:

- To learn how to solve math word problems following these steps:
  - Read
  - Reread
  - Equation
  - Solve
  - Sentence

- To learn the vocabulary associated with the math problems and the operations. (See below.)
- To learn how to distinguish between the different operations.
- To learn how to do the computations.
- To reinforce and elaborate upon concepts about planets.

Language Objectives:

Skills:

- Listening - to instructions
  - in group discussions
- Speaking - group discussions
- Reading - math word problems
- Writing - answers in complete sentences

Linguistic Knowledge:

Vocabulary:

- Celsius temperature, average, degrees, surface, gravity, kilograms, weighs, difference, decimal, equals, plus, minus, times, divided by, divided into, reread, equation, solve, declarative, period, question mark, column form

Structures:

- Declarative sentences
- questions
- conditional verb forms (e.g., would weigh)
- future tense
- present tense in adverbial clauses of time (when she returns....)

Discourse Markers:

- Ordinal numbers: first, second, third, fourth, fifth, etc.

Functions:

- Stating (answers to math word problems in whole sentences).

Learning Strategies:

Metacognitive Strategies:

- Advance organization
- Selective attention
- Organizational planning
- Self-monitoring
- Self-evaluation

Cognitive Strategies:

- Inferencing
- Note taking
- Summarizing
- Deduction/induction
- Imagery
- Elaboration
- Transfer

Social-Affective Strategies:

- Cooperation
- Asking questions
- Self talk

Materials:

- Worksheet of problems.

Procedures:

I. PREPARATION:

- Distribute the problem worksheet to the students.

Ask:

- What are we going to do today?
- How many problems are there?
- Read the problems and circle any words you don't know.

When the students have completed this, ask them what words are circled. List the words on the board. Tell the students they are to work in groups and they have 5 minutes to guess what the word means by giving a synonym for it. Review what a synonym is. Remind them how to guess the meaning of a word e.g., root word, word in context. They should have a picture of the Solar System to help them guess as well. Circulate and give assistance when needed.

[Imagery]

After 5 minutes the students will provide the synonyms for the words on the board. The teacher writes them beside the words and asks for explanations if necessary.

[Advance Organization] *[Inferencing]* *[Cooperation]*
[Self-Monitoring] *[Asking Questions]*
[Self-Evaluation]

Strategy Instruction:

[Imagery]--

- How did you do?
- What helped you to guess the meanings the most? (context, pictures)
- How did the pictures help you?
- Give me an example?
- What strategy is that on the green sheet?

[Inferencing]--

- Were your guesses correct?
- Why were they correct?
- When you make intelligent guesses about the meaning of a word, what strategy is that? (inferencing)

II. PRESENTATION:

Teach the students how to do math word problems using the following steps:

1. READ
2. REREAD
3. EQUATION
4. SOLVE
5. SENTENCE

Write the steps on the board and ask:

- What does this mean?

1. - Let's look at the FIRST step. What do we do? (read)
   - What do we read? (the problem)
   - What are we looking for as we read the problem in the FIRST step? (operation)
   - What operations are there? (review using summary table:)

OPERATION	Addition	Subtraction	Multiplication	Division
SIGN	+	-	X	÷
WORDS	plus add	minus subtract take away	times multiplied by	divided by

2. - What is the SECOND step? (reread)
   - What does REREAD mean? (to read again)
   - What is the RE before the word read? (prefix)
   - What does RE on the front of a word mean? (again)
   - What are we going to look for when we REREAD the problem? (numbers)

3. - What is the THIRD step? (equation)
   - What is an equation? (what you are going to do)
   - Do you have the answer when you write the equation? (no)
   - What will be at the end of your equation? (a letter)
   - Why? (that is what we are solving for)

4. - What is the FOURTH step? (solve)
   - What do you do when you solve the problem? (find the answer)

5. - What is the LAST or FIFTH step? (sentence)
   - What does that mean? (You write your answer in a sentence)
   - Where will you find most of the words for your sentence? (in the question)

Good. Let's look at problem #1 (see **end of lesson** for list of problems). Model how to do the first problem.

1. Ask a student to READ the first problem. Before he/she reads the problem, ask:

   - What are we going to be looking for as he/she reads the problem? (the operation)

   The assigned student reads the problem.

   - Which operation will we be doing? (addition)
   - What is the word for "+"? (plus or add)

2. Ask:
   - What is the next step? (reread the problem)
   - What will we be listening for this time? (numbers)
   - What could we do to help us remember the numbers? (write them down)
   - Okay, let's write them down as he/she reads the problem.

Ask another student to REREAD the problem.

- What numbers did you write down? (10 30 1)
- What are we going to add? (30 + 10)
- What about the 1? (We don't need it.)
- Why not? (Because 1 year = 30 years on Saturn)

3. Ask:

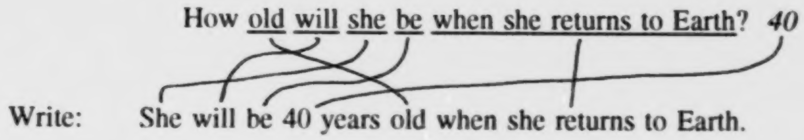
- What is the THIRD step? (Write an equation)
- What would you write? (30 + 10)
- What comes after 30 + 10? (equals)
- What is the sign for equals? (=)
- What comes after the equals in an equation? (a letter)
- Which letter do you want to use? (n) Write 30 + 10 = n

4. Ask:

- What is the FOURTH step? (solve)
- What do you do when you SOLVE a problem? (find the answer)
- Are we going to add across the line or in column form? column form) Write it in column form.

	tens	ones	
three plus	3	0	zero plus
one	+ 1	0	zero
four	4	0	zero

5. Ask:
   - What is the LAST step? (Write a sentence)
   - What is the question?
   - ____________________, please read the question.
     "How old will she be when she returns to earth?"
   - How do you know that is the question? (question mark)
   - What kind of sentences are the other sentences? (declarative sentences)
   - What does a declarative sentence do? (tells you things)
   - What does it end with? (period)
   - What are we going to write in our sentence? (words from the question and the answer)
   - Underline the words you will use from the question.



How old will she be when she returns to Earth? *40*

Write: She will be 40 years old when she returns to Earth.

Strategy Instruction:

[Deduction/Induction]--

Ask:

- What will be the first word? (she)
- What do we put on the first letter? (capital S)
- Why? (beginning of a sentence)
- What are the next words? (will be)
- What comes after that? (40)
- 40 what? (years old)
- What is next? (when she returns to Earth)
- What do we put at the end of the sentence? (period)
- What kind of sentence is it? (declarative)
- How many words are in the answer? (11)
- How many of those words come from the question? (9)

[Advance Organization]	*[Inferencing]*
[Selective Attention]	*[Note Taking]*
[Organizational Planning]	*[Summarizing]*
	[Transfer] (not on the sheet) - done when computing or solving the answer.
	[Deduction/Induction] (not on the sheet) - done when writing their sentences.

Strategy Instruction:

[Inferencing & Note Taking]--

- When you READ the problem in the FIRST step, what did you do? (wrote down the numbers)
- When you REREAD the problem in the SECOND step, what did you do? (wrote the operation)
- Did you know exactly what to write at first, or did you make an intelligent guess? (intelligent guess)
- What strategy is that on the green sheet? (inferencing)
- Why did you write the numbers and operation? (helped us remember)
- What strategy is that? (note taking)

[Summarizing]--

- When you wrote the equation, what was that? (a summary)
- A summary of what? (what we were going to do)
- What strategy is that? (summarizing)

III. PRACTICE:

- Have the students work in pairs to complete problem #2 following the steps on the board. The teacher circulates, giving assistance through questioning when needed.

[Self-Monitoring]
[Selective Attention]

[Inferencing]
[Note Taking]
[Summarizing]
[Transfer]
[Deduction/Induction]

[Cooperation]
[Asking questions for clarification]

IV. EVALUATION:

- When most of the students have completed the problem, have different students demonstrate the different steps. This will allow them to SELF-EVALUATE.

[Self-Evaluation]

V. FOLLOW UP:

The students complete the problem worksheet with their partners. When completed they present it and read it to the teacher. Check it for, and discuss:

a) correct procedures
b) correct answers
c) correct sentences

[Self-Monitoring]
[Self-Evaluation]

[Inferencing]
[Note Taking]
[Summarizing]
[Transfer]
[Deduction/Induction]

[Cooperation]
[Asking questions]

Mathematics Problems for Lesson 3

1. Kuldip is 10 years old on Earth. She has chosen to go for a trip to Saturn. She stays on Saturn for 1 Saturn year, which is 30 years on Earth. How old will she be when she returns to Earth?

2. The average temperature on Venus is 480 degrees Celsius. The average temperature on Earth is 22 degrees Celsius. What is the difference between the average temperature on Venus and on Earth?

3. The surface gravity of Earth is 1. The surface gravity of Jupiter is 2.54. If a woman weighs 50 kilograms on Earth, how much would she weigh on Jupiter?

4. The surface gravity of Earth is 1. The surface gravity of Pluto is believed to be .05. If a man weighs 60 kilograms on Earth, how much would he weigh on Pluto?

Lesson 4: Planet Research (Science, Language Arts)

Objectives:

Content Objectives:

- To learn how to use the library to find resources for a research project.
- To do research on a science topic and to write a report on it.
- To learn information about a planet in order to make a presentation at a later date.

Language Objectives:

Skills:

- Listening - to instructions
  - in group discussions
- Speaking - in group discussions
  - when editing
- Reading - reference materials for specific information
  - his/her research report when editing it with the teacher.
- Writing - a research report

Linguistic Knowledge:

Vocabulary:

- revolution, rotation, diameter, atmosphere, surface, satellites, reference, resources, filmstrips, encyclopedias, dictionaries, represent, gods, goddesses, mythology, oxygen, carbon dioxide, nitrogen, helium, hydrogen, methane, ammonia, gases, symbol, craters, core, channels, volcanoes, valleys, canyons; idiom "to name X after Y."

Structures:

- Capitalization (proper nouns)
- Punctuation
- Prepositional phrases
- Subject-verb agreement
- Conjunctions
- Clauses
- Sentence structure

Discourse Features:

- Paragraph formation

Functions:

- Reporting: writing a research report.
- Defining: E.g. "The landscape is rocky with deep
  pole on Mars there is a white area called a polar

Learning Strategies:

Metacognitive Strategies:

- Advance Organization
- Organizational Planning
- Selective Attention
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Resourcing
- Note Taking
- Summarizing
- Elaboration
- Inferencing

Social-Affective Strategies:

- Cooperation
- Questioning for clarification

Materials:

- Books and resources from the library.

Procedures:

I. **PREPARATION:**

Each students chooses a planet he or she would like to res
students may work together on the same planet.

The students go to the library and have the librarian
catalogue for books and resources about their planets, the Solar

The students sign the books or resources out to prepare f

[Advance Organization] *[Resourcing]*
[Imagery]

h report.

pe is rocky with deep holes called craters." "At each
te area called a polar cap."

n

ibrary.

r she would like to research. If it is a large class, two
lanet.

d have the librarian help them to look in the card
neir planets, the Solar System or the Universe.

urces out to prepare for note taking in their research.

urcing] *[Cooperation]*
ery]

Strategy Instruction:

[Resourcing]--

Ask:

- What kinds of books are you going to use? (library, reference, encyclopedias, filmstrips, dictionaries, etc.)
- How will these books help you? (find extra information)
- When you want to find extra information, where do you think you will find it? (library)
- What does the library have? (books, dictionaries, filmstrips, encyclopedias, etc., OR, lots of resources)
- This is a strategy which is not listed on the sheets.
- What do you think we could call it when you use different resources? (resourcing)
- How does resourcing help you? (find extra information to understand and complete the task)
- What sheet should we put it on? (the green sheet)
- Why? (it helps us to understand)
- What should we write to describe RESOURCING? (write a class definition, e.g., Use RESOURCES such as reference materials)

[Imagery]--

- Show two books, one with only written text & few pictures and one with many pictures.

Ask:

- Which book would you rather use? Why?
- When you were looking for your library materials or books, which books attracted you? (books with pictures and charts)
- Why? (easier to understand)
- What strategy is that on the green sheet? (use images and pictures)
- How do images and pictures help you to understand or remember?

II. PRESENTATION:

In the classroom the teacher reviews the questions the students will use and discusses the new vocabulary.

1. What does the name of the planet represent?
2. What is the distance of the planet from the sun?
3. How large is the diameter across the planet?
4. What is the atmosphere on the planet?
5. What is on the surface of the planet?
6. What is the average temperature of the planet?
7. How long is one revolution or year?
8. How long is one rotation or day?
9. How many satellites does the planet have?

10. Are there any other interesting facts about the planet?
11. What is the symbol of the planet?

It is not necessary to model the research activity for the students, as this is an advanced level and most of these students have done research before (e.g. an intermediate unit on animals, during the previous year -- see Chapter 5). If new students are in the class assist them individually. Other students may assist them as well.

[Organizational Planning]	*[Resourcing]*
[Selective Attention]	*[Grouping]*
	[Note Taking]
	[Elaboration] (discussed in Evaluation phase)
	[Inferencing]
	[Pictures/Images]

Strategy Instruction:

Before the students begin the research activity ask:

[Resourcing]--

- Look through your books for information for two minutes. After two minutes, ask:
    - Did you find information?
    - What did you find?
    - Did any of you find a chart?
    - What is a chart? (summarized information)
    - How many questions will you be able to answer using this chart? (6)
    - Is the chart a good resource to use?
    - Why? (summarized, easy to read, point form)
    - What strategy are you using when you use these books and this chart? (Resourcing)
    - How will resourcing help you?

[Grouping & Selective Attention]--

- On the chart how is the information written? (point form)
- What are the headings?
- If you want to answer question #2, where will you get that information? (under distance from the sun)
- How is the information or are the facts presented on the chart? (in groups)
- Did you know where to find the information for question #2? (yes)
- What word in question #2 helped you to find the information on the chart? (distance)
- Which strategy are you using when one word helps you to find the information you need? (Selective Attention)
- What words in question #3 will help you? (diameter)
- What words in question #4 will help you? (atmosphere)
- How do you know where to write the words? (by the important words)

- What strategy are you using when you write the words where they belong? (grouping)
- Does SELECTIVE ATTENTION to key words help you?

[Note Taking]--

- As you are GROUPING the information to the correct question, what are you writing? (answers)
- When you are writing the answers as you are reading, what are your writing? (important ideas)
- What strategy is that? (note taking)
- How does it help us? (we complete the task and we remember the information)
- Do you write the answers in complete sentences? (no)
- What do you write? (important words or ideas)

[Inferencing]--

- When you are completing the questions to fill in the missing parts, how do you know if you are correct? (intelligent guesses)
- When you make intelligent guesses to complete the missing parts, what strategy are you using? (inferencing)
- Does INFERENCING help you complete the task?

[Pictures/Imagery]--

- Not all the information is on the chart.
- What questions are not on the chart?
- Can anyone find #1 what their planet represents? (the students will read about gods and goddesses in Greek and Roman mythology. This is an extremely difficult concept for the students to understand. The book **National Geographic Picture Atlas of Our Universe** by Roy A. Gallant is an excellent resource as it contains pictures of the gods and goddesses with brief explanations.)
- Show the picture of a god and read the brief explanation.

Ask:

- Do you understand what your planet represents now?
- What do you think a god/goddess was?
- Why did people name the planets after them?
- What helped you to understand? (the picture)
- Do the pictures in this book help you to understand the information as you are reading it?
- What resource are you using? (pictures/images)
- Do you think you should always look for good resources with good pictures to help you in other subjects?

II. PRACTICE (1ST PHASE)

The students will complete the questions by reading their resources or materials and writing the information as they find it. Although each student has chosen his/her own planet, they work together to assist each other in finding the necessary information.

The teacher circulates to give students the cues or assistance they need to move ahead.

[Selective Attention]
[Self-Monitoring]
[Note Taking]
[Resourcing]
[Grouping]
[Elaboration]
[Inferencing]
[Imagery]
[Cooperation]
[Asking Questions]

V. EVALUATION: (1ST PHASE)

When the students have written all the necessary information to complete the task, they show it to the teacher.

The teacher discusses with the students how they are going to write the first draft of their planet research.

Strategy Instruction:

[Deduction/Induction]--

Looking at question #1:

- What will your first sentence be?
- What words would you use from the question? (Underline the words as the students tell you them.)

1. What does the name of the planet represent?
(They write the name of the planet they researched.)

Write:
e.g. Mercury

The name Mercury represents, in Roman mythology, the Messenger of the gods.

Strategy Instruction:

[Deduction/Induction]--

Ask:
Integrating capitalization:

- What do you have to remember to put on the first letter of Mercury? (capital letter)
- Why? (It is the name of a particular planet -- proper noun)
- What other words did you capitalize in this sentence? (Roman and Messenger)
- Are they proper nouns? (yes)

Integrating subject-verb agreement:

- What do you have to add to "represent"? (s)
- Why?
- What word in the question is a clue or a reminder that helps you remember to add an "s" to the verb? ("does")
- Whenever you see "does" in the question what will you do? (add an "s" to the verb)
- What other questions have "does" in them? (number 9)
- What word will you add "s" to? (have)
- Will you add "s" to have? (no)
- Why not? (no such word)
- What will you write instead? (has)

Integrating punctuation and prepositional phrases:

- What did you put after "represents"? (a comma)
- Why? ("in Roman mythology" is extra information and that is how it was in the reference book)
- Where else do you have a comma? (after "mythology")
- Could you have writtten that sentence without "in Roman mythology"? (yes)
- Would the sentence have made sense without "in Roman mythology"? (yes)
- What does the "in Roman mythology" tell you? (where it comes from)
- Does it give you extra information to make it clearer to you? (yes)
- What is the root word of "Roman"? (Rome)
- Where is Rome? (Italy)
- When does "Roman mythology" refer to? (a very long time ago - 1000's of years)
- What is "in Roman mythology" called? (phrase)
- What is a phrase? (a group of words)
- What is the first word in this phrase? ("in")
- What kind of word is "in"? (preposition)
- What kind of phrase is this if it begins with a preposition? (prepositional phrase)

These are some examples of how the teacher and the student review all the necessary structures to complete the task of writing the research report.

Other structures which are integrated are:

- conjunctions
  e.g. "The diameter of Mercury is 4,880 km **or** 3,033 miles."

- clauses
  e.g. "The temperature of Mercury is much hotter during the day because Mercury's orbit is elongated not circular."

The teacher would discuss these structures with the students as they occurred and were written into their research reports.

[Self-Evaluation] *[Deduction/Induction]* *[Cooperation]* *[Questioning for Clarification]*

III. PRACTICE (2ND PHASE)

Each student writes the information into a proper paragraph.

[Self-Monitoring] *[Deduction/Induction]*

IV. EVALUATION (2ND PHASE)

Each student edits while reading his or her paragraph with the teacher for the final draft.

[Self-Evaluation] *[Deduction/Induction]* *[Cooperation]* *[Questioning for Clarification]*

V. FOLLOW UP:

The students draw pictures of their planets on pieces of large colored construction paper. They choose appropriate colors for their planets. They compare the size of their planets with the other planets to ensure they draw the correct size. They outline their planets in black felt and write the final draft on their planets.

Once their planets are completed they practice reading and presenting them for their presentations to the class.

After the class presentations, the planets are displayed on the bulletin board. They are placed in order on black paper, and white yarn is used for their orbits.

This provides visual reinforcement of the project and presentation.

Strategy Instruction:

[Elaboration]--

- What do you know about your planet?
- Did you know this a week ago?
- Did you know this at the beginning of this unit?
- What have we built upon in each lesson? (prior knowledge)
- What did we add to it? (new knowledge)
- What do we call the strategy of building new knowledge on old knowledge? (elaboration)

Lesson 5: Planet Presentations (Science, Language Arts)

Objectives:

Content Objectives:

- To learn how to present a project to the class.
- To learn about other planets in the Solar System.

Language Objectives:

Skills:

- Listening - to oral presentations
  - for information
  - to take notes
- Speaking - making presentations that have been rehearsed
  - in group discussions
  - to give answers
- Reading - the research project orally
  - the summary to give answers
- Writing - to take notes

Linguistic Knowledge:

Vocabulary development:

- All the new vocabulary associated with the presentations, e.g., represents, average, revolution, rotation, other, symbol.

Structures:

- point form
- capitalization
- commas

Discourse Features:

- Listening to and understanding the rhetorical organization of a research report to take notes in a summary.

Functions:

- Describing in point form - filling in a chart in point form to complete a summary.

Learning Strategies:

Metacognitive Strategies:

- Advance Organization
- Selective Attention
- Organizational Planning
- Self-Monitoring
- Self Evaluation

Cognitive Strategies

- Note taking - to learn how to take notes during a presentation.
- Summarizing - to learn how to make a summary.
- Grouping - the information into the correct heading or classification.
- Elaboration - individual project --> point form summaries.
- Inferencing - guessing to complete the missing parts of the summary.

Not on green sheet:

- Auditory representation - playing back the information mentally as they are note taking.
- Transfer - information about their project to the summary.

Social-Affective Strategies:

- Asking questions
- Cooperation
- Self talk

Materials:

- Chart based on the same information in the same order as the questions the students used for their planet research.

Planets Chart

Planets	**Mercury**	**Venus**	**Earth**	**etc.**
Represents				
Distance from Sun				
Diameter				
Atmosphere				
Surface				
Average Temperature				
Time of Revolution				
Time of Rotation				
Other				
Symbol				

Procedures:

I. PREPARATION:

The students are aware of the order of the presentations and have practised reading their projects during a previous lesson and at home.

The students are given a chart which is a summary; they review it with the teacher.. The chart is based on the same information in the same order as the questions for the planet research.

[Selective Attention]	*[Note Taking]*
[Organizational Planning]	*[Summarizing]*
[Advance Organization]	*[Grouping]*

Strategy Instruction:

Let's look at your green sheet.

[Note Taking]--

Ask:

- Why were you given this chart? (to fill in)
- When? (during the presentations)
- What strategy will you be doing as you fill in the chart as you are listening? (note taking)

[Summarizing]--

- As you are note taking, what will you be filling in? (information)
- What kind of information? (important ideas)
- When you have taken notes of just the important ideas, what other strategy have you done? (summarizing)
- How many planets are we presenting today? (2)
- How many planets do we have to present altogether? (9)
- How many summaries will you have? (8 + 1 of mine = 9)
- Then you will know about all the planets in the Solar System and not just yours.

[Grouping]--

- When you are writing your summaries, where would you write 365 days? (beside revolution)
- Why? (It belongs there)
- How do you know? (That's how long it takes for the Earth to revolve around the sun.)
- What strategy are you using when you classify words to where they belong? (grouping - on the green sheet, "Classify or Group ideas".)

[Selective Attention]--

Let's look at the blue sheet.

- When you are listening for specific information or key words during the presentations, what words will you be listening for? (represents, distance from sun, diameter, atmosphere, surface, average temperature, revolution, rotation, other, symbol).
- When we listen for -- or pay attention to -- key words, what strategy are we using? (Selective Attention)

[Organizational Planning]--

- Let's review the task.
- What are we going to do? (listen to the presentations and take notes to fill in the summaries)
- How should the presenter read? (slowly)
- What will you be listening for? (key words)
- Do you think you will get all the information in the first reading or will the presenter have to read it more than once? (more than once)
- When you have most of the information you will be divided into groups to check your answers. The presenter will correct the answers with you.
- What strategy are we using? (planning what we will do)
- What does this help you do? (learn)

II. PRESENTATION:

A designated student stands at the front of the room, shows his/her planet and reads his/her project slowly to the class. As the presenter reads, the students listen and take notes to complete their charts.

[Self-Monitoring]
[Selective Attention]

[Note Taking]
[Summarizing]
[Grouping]

[Cooperation]

Strategy Instruction:

[Self-Monitoring]--

After the first reading, ask the students:

- Did you complete the summary? (no)
- Do you need another reading? (yes)
- Let's have _______________ read his/her project one more time so you can complete the summary and check your answers.

The presenter reads the project at a regular rate.

This procedure provides the presenter with a purpose for reading clearly and carefully to the class instead of rushing through the presentation. This also promotes a positive atmosphere for the presenter and the class.

Using **SELECTIVE ATTENTION** during this procedure gives the students a purpose for listening to the presenter instead of "tuning out" until it is their designated time to present.

Another advantage to this technique or procedure is **all** of the students will have **all** of the information about **all** of the planets rather than just their own.

III, IV. PRACTICE AND EVALUATION:

Assign each student to a partner. Set a definite time limit, 5 minutes for the students to compare and correct their answers with each other.

When this task has been completed the PRESENTER corrects the information with the students following the same summary which the teacher has written on the board.

The PRESENTER fills in the title, e.g.,Mercury. The PRESENTER asks the class questions to elicit the correct responses for each of the classifications on the summary. E.g.,

- What does the name of Mercury represent? (question #1 from the research project), etc.

The students raise their hands and provide the PRESENTER with the information. The PRESENTER writes it on the board correctly, checking the spelling and information against their own project which is correct. The students check the PRESENTER'S summary information against their summaries to correct them.

- Point form and punctuations are taught and integrated at this point.

V. FOLLOW UP - STRATEGY INSTRUCTION:

Let's look at the Blue sheet:

[Planning]--

- What strategies did you use to learn more? (planning)
- When did you plan? (during the preparation when we were preparing for note taking and going over the summary on the chart.)

[Selective Attention]--

- What other strategy? (selective attention)
- When did you use selective attention? (during the preparation when we were discussing what words to listen for in the presentation.)
- Do you understand why we added it to the BLUE sheet?

[Monitoring]--

- What other strategy? (monitoring)
- When? (during the presentation we were listening and taking notes. We could monitor how we were doing.)
- How did you do?
- Did you get all the information from the first reading? (no) Second reading?

[Evaluation]--

- What other strategy did you do? (evaluation)
- When? (when we finished listening and when we were correcting)
- Did I evaluate you or did you evaluate yourselves? (we did.)
- How did you do?
- Was most of your information correct?

How did these metacognitive strategies on the Blue sheet help you learn more? (We know about all the planets in the Solar System besides our own.)

Let's look at the Green sheet:

[Note Taking]--

- What strategies did you use on the Green sheet to help you understand and remember? (take notes)
- When did you take notes? (during the presentation)
- How did that help you? (helped us remember the information)
- What did you write down? (important ideas)

[Summarizing]--

- What other strategy did you do as you were note taking? (summarizing)
- When did you summarize? (as we listened for important ideas or key words to fill in the chart)
- What is the chart? (a summary)
- What was the summary similar to? (the questions used during the research)
- Do you think I did that on purpose? (yes)
- Which is easier to understand, the paragraph about the planet or the summary? (summary)
- Why? (point form, important ideas)

[Grouping]--

- What other strategy did you do when you were note taking? (grouping)
- How did you group? (when we heard a word we had to know where to put it in the summary - under which heading or category.)
- Do you think doing your own project helped you to recognize where to group the word during the presentation? (yes)
- When you group words together is it easier to understand and remember?

- Could you do this with other words? (yes)
- When?

[Elaboration]--

There is another strategy on the Green sheet that you did. Do you know what it is? (Elaboration. If they cannot identify it, tell them.)

- How did you do this?
- What did you know yesterday?
- What did you learn today?
- If you had not researched a planet yourself would you understand the presentation today or would it have been difficult?

Other cognitive strategies not on the green sheet -- Discussion is optional depending upon your students and their knowledge of the strategies.

[Auditory Representation]--

- When? (during note taking)
- How? (as they were recalling words to write down)

[Transfer]--

- When? - using previous vocabulary
  - using note taking
  - summary of other new information
- How did all of these Cognitive strategies on the green sheet help you?
- Do you understand the information that was presented? (yes)
- If I asked you a question about a planet could you answer it? (yes)
- Why? (because we have the information in a summary)
- Turn your papers over. [Ask some questions from a presentation which was just done.]
- How did you remember this?

Let's look at the Pink sheet:

- What strategies did you use on the Pink sheet to help yourself and others to learn?

[Cooperation]--

- When? (during the presentation when the presenter read slowly so we could take notes)
- When else? (when we were comparing and correcting our outlines after the presentation)
- When else? (when correcting the outline with the presenter)
- How? (gave the presenter the information to fill in the summary)
- What other strategies did you use on the Pink sheet? (Asking questions)
- When? (when we were comparing and correcting with our partner or group)

- When else? (during the correction with the presenter)
- Were most of your answers correct? (yes)

Great! Do you think these strategies help you to learn, understand and remember?

- Please read your charts to me before you leave.

EXTENDED ACTIVITIES:

Listed in Santillana *Bridge to Communication, Middle Level C, Teacher's Guide*, p. 250 (see Chapter 2).

- Using their charts they rank the diameters of the planets from largest to smallest.

Santillana *Bridge to Communication, Middle Level C, Student Worksheet*, 10.4.

Using their charts the students write the diameters below the names of the planets and fill in ">" or "<". E.g.,

Mercury ______ Venus
_____ km   _____ km

At this point in the unit we have completed the work on the Solar System. A natural progression is into "The Space Race". We were very fortunate as Canada's Roberta Bondar went into space just as we completed our planet study. We worked from newspaper articles in the *Winnipeg Free Press* and the *Globe and Mail*. We watched television for coverage of her space flight as well.

This was an interesting way of integrating history into our unit. The students enjoyed this part of the unit and know more about Roberta Bondar than the students in their regular (mainstream) classes.

Although this information is dated, it is included here because it provides an example of how to work from another medium (newspaper and television). Besides, there are always space flights occurring, and the students will benefit from this experience.

The Planets

Learning Log -- Lessons 1-5

Note: This list follows the Learning Log format in Chamot & O'Malley's *Building Bridges*, 1992 (see Chapter 2).

VOCABULARY:

Solar System Nouns

___ Mercury
___ Venus
___ Earth
___ Mars
___ Jupiter
___ Saturn
___ Uranus
___ Neptune
___ Pluto
___ Atmosphere
___ craters
___ gravity
___ orbit
___ path
___ planets
___ rocket
___ satellites
___ star
___ sun

Miscellaneous Nouns

___ axis
___ back
___ canyon
___ Celsius
___ channels
___ core
___ day
___ degrees
___ dictionary
___ distance
___ encyclopedia
___ filmstrip
___ flashlight
___ front
___ glob
___ god
___ goddess
___ mythology
___ night
___ period
___ question mark
___ resources
___ rotation
___ revolution
___ step
___ surface
___ symbol
___ temperature
___ trip
___ valley
___ volcano
___ year

Math Nouns

___ average
___ circle
___ decimal
___ diameter
___ difference
___ equation
___ kilogram
___ kilometer
___ sphere

Math Verbs

___ divided by
___ divided into
___ equals
___ measure
___ minus
___ plus
___ represent
___ reread
___ revolve
___ rotate
___ select
___ selected
___ solve
___ times
___ weigh

Gases - Nouns

___ ammonia
___ carbon dioxide
___ helium
___ hydrogen
___ methane
___ nitrogen
___ oxygen

Comparatives & Superlatives

___ colder
___ coldest
___ closer
___ closest
___ farther
___ farthest
___ hotter
___ hottest
___ longer
___ longest

Adjectives

___ declarative
___ other
___ reference
___ round
___ selective

CONTENT:

I can:

________ Name and identify the planets in the Solar System.
________ Explain rotation, day and night.
________ Explain revolution, orbit and year.
________ Write a math equation.
________ Solve math word problems.
________ Find resources and reference materials in the library.
________ Do a research project about planets.

LANGUAGE:

I can:

________ Answer questions in declarative sentences.
________ Write a science report about a planet.
________ Make a class presentation.
________ Write a summary in point form.

LEARNING STRATEGIES:

I can:

________ Take notes from a listening activity.
________ Take notes from a reading activity.
________ Use reference materials and other resources.
________ Use pictures to help me understand.
________ Write a summary from a listening activity.
________ Group words according to their heading or classification.
________ Elaborate upon previous knowledge.
________ Inference or guess to fill in the missing parts.
________ Evaluate my work.
________ Cooperate to work with others.
________ Ask questions to get information.

Lesson 6: The Discovery (Language Arts, Science)

Note:

This lesson and the remainder of this unit could be done with any space mission occurring on television. Roberta Bondar and the Discovery were chosen for this unit as an example. This particular mission is illustrated because Roberta Bondar was the first Canadian woman astronaut in space. All the remaining lessons can be done using the *Discovery* or any other current space mission. Although the information or content would be different, the procedures would remain the same.

Objectives:

Content Objectives:

- To elaborate upon the information and vocabulary developed for the Solar System and planets.
- To learn about the parts of a rocket.
- To witness and learn about a rocket lift-off and the stages involved.

Language Objectives:

Skills:

- Listening - in group discussions
  - to TV documentary for specific information
- Speaking - in group discussions
  - with a partner
- Reading - answers to the questions
  - of descriptive paragraphs
- Writing - of descriptive paragraphs
  - answers to questions

Linguistic Knowledge:

Vocabulary:

NASA spacecraft, astronaut, crew, space suit, space shuttle, launch pad, cargo bay, flight deck, living quarters, space laboratory, rocket, mission, lift-off, explorer, discoveries, voyages, danger, transportation, ship, disease, sank, explode, motion sickness, unknown, astroids, telescope, galaxy, comet, Big Dipper, star, meteor, eclipse.

Structures:

- Capitalization - astronauts, countries, mission
- Punctuation - commas when listing information
- Past tense - answering the question about the lift-off which is an excellent

example of the past tense as it has just occurred.
- Venn diagram - discussion about astronauts.
- Transforming questions to statements.

Functions:

- Describing and reporting - writing a paragraph/report describing the lift-off.

Learning Strategies:

Metacognitive Strategies:

- Advance Organization
- Selective Attention
- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Imagery
- Resourcing - to learn how to use television as a source of information.
- Grouping
- Summarizing
- Note Taking
- Deduction/Induction

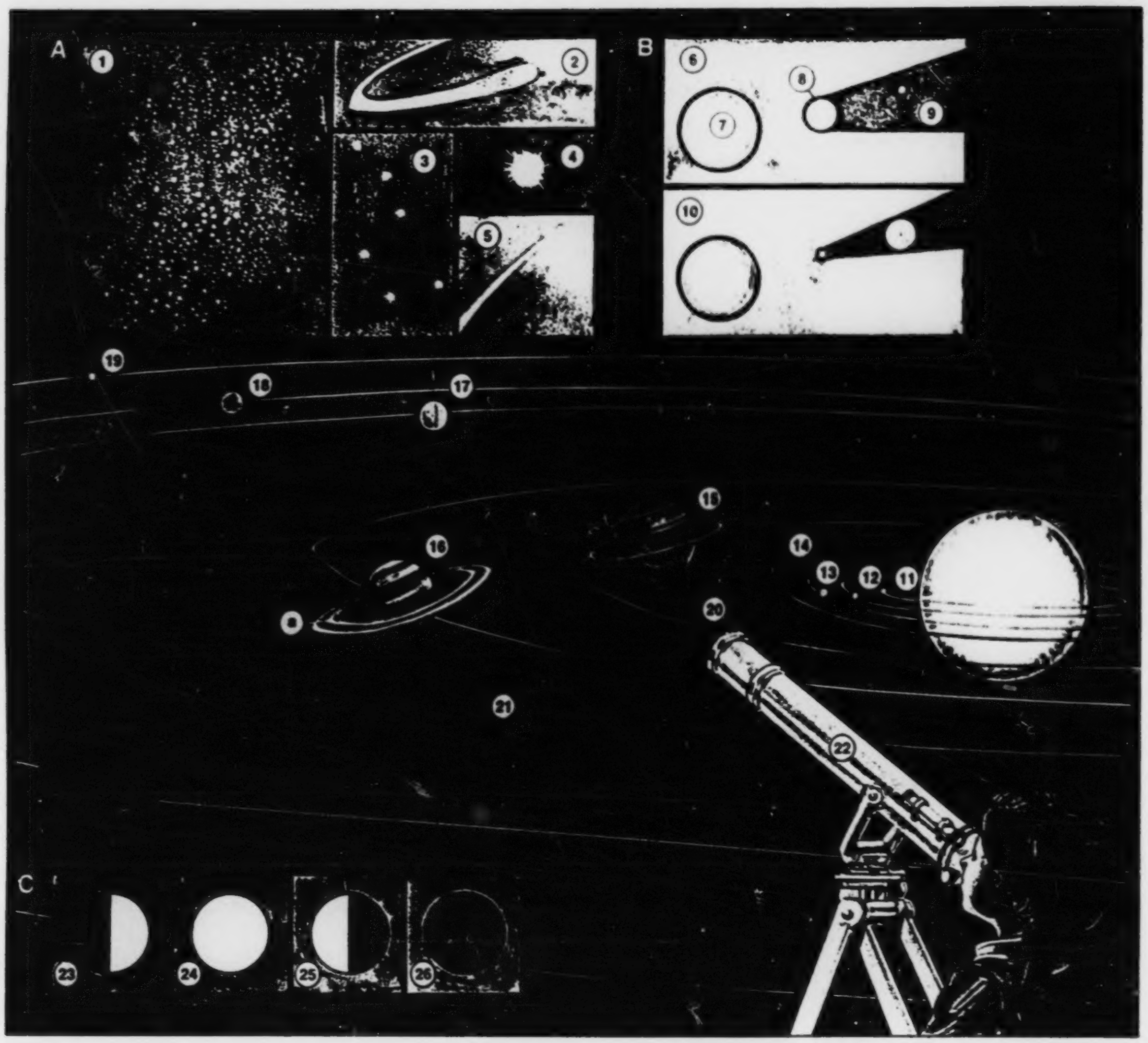
Social-Affective Strategies:

- Cooperation
- Asking questions for clarification

Materials:

- Parnell, E.C. (1988). *The New Oxford Picture Dictionary.* New York: Oxford University Press, pp. 74-75.

- A television broadcast of a rocket lift-off or launch. The Discovery was the mission chosen for this lesson, but (as mentioned above) any other mission may be chosen.


A
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A. Outer Space
1. galaxy
2. comet
3. (Big Dipper) constellation
4. star
5. meteor

B. The Solar System
6. lunar eclipse
7. Sun
8. Earth
9. Moon
10. solar eclipse

The Planets
11. Mercury
12. Venus
13. Earth
14. Mars
15. Jupiter
16. Saturn
    a. ring
17. Uranus
18. Neptune
19. Pluto

20. asteroid
21. orbit
22. telescope

C. Phases of the Moon
23. first quarter
24. full moon
25. last quarter
26. new moon

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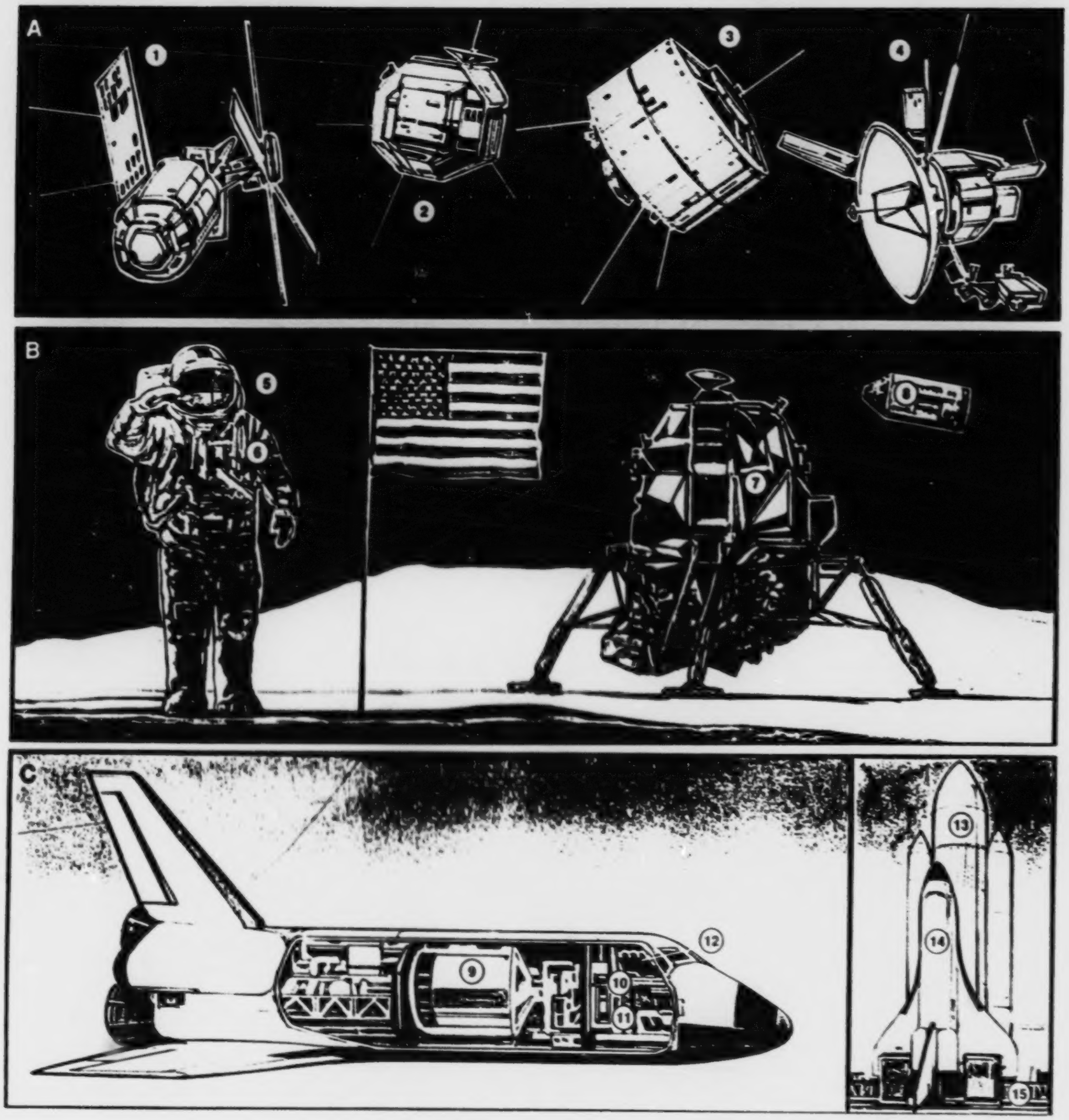

A. Spacecraft

1. space station
2. communication satellite
3. weather satellite
4. space probe

B. Landing on the Moon

5. astronaut
6. space suit
7. lunar module
8. command module

C. The Space Shuttle

9. cargo bay
10. flight deck
11. living quarters
12. crew
13. rocket
14. space shuttle
15. launchpad

New Oxford Picture Dictionary (1988). New York: Oxford University Press, pp. 74-75.

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Procedures:

I. PREPARATION

- Review the planets in the Solar System using a chart or a picture. An excellent source for discussion is *The New Oxford Picture Dictionary* by E.C. Parnell, page 74.

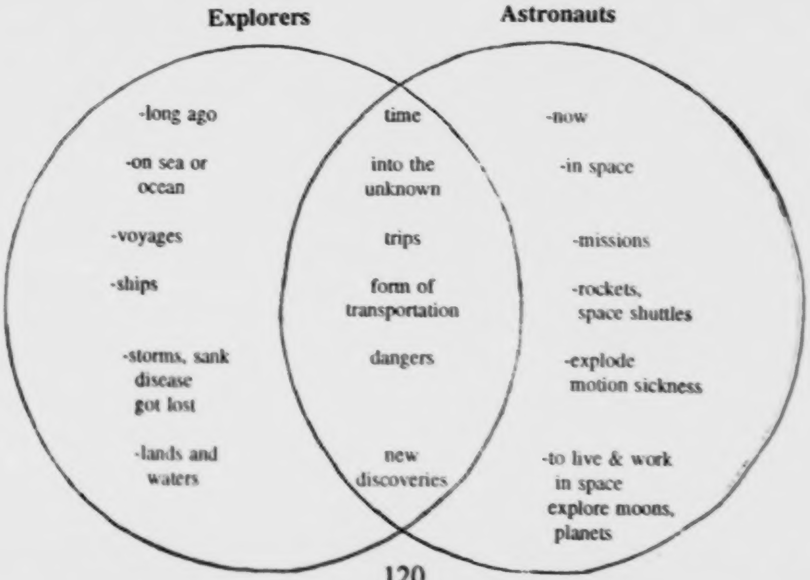
- Introduce and discuss other items on page 74 "The Universe." E.g., asteroid, telescope, galaxy, comet, Big Dipper, star, meteor, eclipse, etc.

- Introduce page 75 "The Space Program" discussing through questioning the vocabulary in the space program.

Ask:

- Why do you think "The Space Program" is located on the page beside "The Universe"? (They are the same?)
- How? (space program goes into space)
- Why? (to find out about things)
- What do they want to find out?
- What is an astronaut? (man/woman in space)
- Who could an astronaut be compared to? (an explorer)
- What did an explorer do? (discover new lands or frontiers)
- What is an astronaut doing? (discovering new frontiers)
- Do you think it was dangerous for an explorer? (yes)
- Why? (old ships & unknown)
- Where did they travel? (across oceans)
- Do you think it is dangerous for an astronaut? (yes)
- Why? (unknown & blow up)
- Where do they travel? (in space)

As you are discussing the similarities and differences between an explorer and astronaut, have the students complete a Venn diagram:


Explorers
Astronauts
-long ago
-on sea or ocean
-voyages
-ships
-storms, sank disease got lost
-lands and waters
time
into the unknown
trips
form of transportation
dangers
new discoveries
-now
-in space
-missions
-rockets, space shuttles
-explode motion sickness
-to live & work in space explore moons, planets

[Advance Organization]
[Selective Attention]

[Imagery]
[Resourcing]
[Grouping]
[Summarizing]

Strategy Instruction:

[Imagery and Resourcing]--

- Did the pictures help you? (yes)
- How? (we understood what the words meant)
- If you want to know the meanings of words, do you think pictures help you to understand and remember them? (yes)
- What book could you use that has pictures in it? (a picture dictionary)
- When you use pictures to help you understand, what strategy are you using on the green sheet? (images and pictures)
- When you use a book or a reference as a resource to help you understand, what strategy are you using? (resourcing)
- When do you use resourcing? (when we need other information)
- Why did we add this strategy to the green sheet? (It helps us to understand and remember)

[Grouping]--

- Did the Venn diagram comparing the explorer to the astronaut help you? (yes)
- How? (we could see what was the same and different)
- How did you know where to write voyage? (belongs under explorer)
- How did you know where to write mission? (under astronaut)
- Why did you write them there? (belonged there - they were different)
- Where did you write trips? (in the middle)
- Why? (the same)
- When you knew where to write the words what strategy were you using? (grouping)
- What were you grouping? (words)

[Summarizing]--

- Once you were finished the Venn diagram what did you have? (All the important information)
- Important information of what? (what was the same and different)
- Is this information clear? (yes)
- When the Venn diagram was completed what strategy had you done? (summarizing)

The ______________________________
(Name of the mission

1. When was the lift-off?

____

____

2A. Who are the astronauts?

____

____

B. What countries are they from?

____

____

3. Where are they going?

____

____

4. How long is this mission?

____

____

5. What is their mission?

____

____

6. Why is this mission important?

____

____

[Organizational Planning] *[Note Taking]*
[Selective Attention]

Strategy Instruction:

[Organizational Planning]-- *[Note Taking]--*

Ask:

- What is the plan? (we write the answers or notes in as we hear them)
- How will this help you? (remember the information)

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[Selective Attention]--

- How will you know when you have heard an answer? (listen for special words)
- What word or picture would you be listening for or watching for in question #1? (lift-off, blast off, counting from 10 backwards)
- When you are listening for special words what strategy is that? (Selective Attention)

III. PRACTICE:

The students watch the television coverage of the lift off or blast off with the group and complete the note taking.

[Self-Monitoring] *[Note Taking]*

When the telecast is over, the students work in groups to complete and correct their worksheets for:

- correct answers
- correct spelling

[Self-Evaluation] *[Summarizing]* *[Cooperation]* *[Asking Questions]*

Strategy Instruction:

[Self-Evaluation]--

Teacher asks:

- How did you do?
- Did you get most of the information?
- Are you ready to give me the answers?

[Cooperation]--
[Asking Questions]--

- Was it easier answering the questions as you were listening or working together in a group?
- As you were asking each other questions about the lift-off, how did it help you learn?
- Does working together and asking questions help you learn?
- What strategies are these?

[Summarizing]--

- Now that you have all the important information in point form, what have you written? (a summary)
- How long was the telecast?

- How many lines are your answers?
- Which is easier to remember for future use? (summary)
- What strategy did you use?

IV. EVALUATION:

The students tell the teacher the correct answers. The teacher writes the correct answers on the board or transparency.

Capitalization (mission, astronauts' names and countries) and punctuation (commas when listing the astronauts and countries) could be integrated into this evaluation phase of the lesson, as you are writing dates, mission, astronauts and countries.

[Self-Evaluation]

V. FOLLOW UP:

The students use the information from the questions to write a descriptive paragraph about the lift-off integrating all the vocabulary, structures and functions listed in the objectives.

[Self-Monitoring] *[Deduction/Induction]*

The students edit their first drafts with a partner and make revisions.

They edit as they read their second drafts with the teacher.

They read their final draft to their teacher and classmates.

[Self-Evaluation]

[Cooperation]
[Asking Questions]

Lesson 7: The Discovery (Language Arts, Science)

Objectives:

Content Objectives:

- To learn about Roberta Bondar and Canada's contribution to the space program.
- To learn about the scientific experiments conducted in a space laboratory.

Language Objectives:

Skills:

- Listening - for information in group discussions
- Speaking - to give information
- Reading - for specific information
- Writing - answers to questions
  - a descriptive report

Linguistic Knowledge:

Vocabulary:

- astronaut, witness, to swamp, swamped, sunrise, sunset, experiment, spacelab, freezing, cells, workday, separate, spin, rotating chair, phase partitioning, results, test, cancerous cells, non-cancerous cells, fruit flies, observe, develop, weightlessness, effects, gravity, neurologist, Hamilton, McMaster University

Discourse Features:

- personal pronouns for reference (they, she, it)
- discourse marker - because

Structures:

- Distinguishing between present tense (events which are still occurring on the mission) and past tense (events which have already occurred on the mission)
- Possessive pronouns - her, his, their
- Negation - not
- Infinitive of purpose - used when combining sentences.
  e.g. "She did phase-partitioning of cells in micro-gravity *to separate* cancerous cells from non-cancerous cells."
- Making compound sentences using coordinating conjunctions
- Making complex sentences using adverbial clauses of reason
- Relative clauses
- Past tense
- Subject verb agreement

Functions:

- Reporting and narrating
- Writing a report describing Canadian astronaut Roberta Bondar's workday or schedule in space.

Learning Strategies:

Metacognitive Strategies:

- Advance Organization
- Selective Organization
- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Imagery
- Prediction
- Inferencing
- Resourcing - to learn how to use the media (e.g. newspapers) as a course of information.
- Note Taking
- Deduction/Induction

Social-Affective Strategies:

- Cooperation
- Asking Questions

Materials:

- Newspaper article -- In this case the Sunday, January 26, 1992 edition of the *Winnipeg Free Press*, p. A4, was used. See the end of this lesson for the text of the article.
- Worksheet of questions about the article.

Procedures: (Note: The procedure used for this lesson is the same as the one used for Lesson 1 of this unit.)

I. PREPARATION:

- Review the telecast of the lift-off. Discuss its importance.
- Distribute newspaper article on Roberta Bondar, "Spacewoman Swamped".

1. Tell the students to look at the title, subtitle and photograph of the article to predict what they think this article is about. They have one minute.

[Advance Organization] *[Prediction]*
[Imagery]

2. After one minute tell the students to write down what they think the article is about.

3. Listen to each student's prediction. Write the key words on the board.

4. Look at the article and discuss the title, subtitle and photograph with the class e.g.

   - What is the title? (Spacewoman swamped)
   - Who is the spacewoman? (Roberta Bondar)
   - What is Roberta Bondar? (astronaut)
   - What is she doing? (working)
   - What does "swamped" mean? Is she in a swamp? (no)
   - When we say someone is swamped, what does that mean?
   - When we say Roberta Bondar is swamped what does that mean?
   - Do you know what that is called? (idiom) Give other examples.
   - What is the subtitle? (Bondar misses sunrise, sunset)
   - What is a sunrise?
   - What is a sunset?
   - Why do you think Roberta Bondar missed them?
   - What do you see Roberta Bondar holding in the photograph? (oat seedlings)
   - How do you know? (says below the photograph)
   - What are oat seedlings?
   - What is she going to do with this seedlings? (experiment)
   - Why do you think she is doing these experiments in space?

[Selective Attention] *[Inferencing*
[Organizational Planning] *[Imagery]*
[Resourcing]

II. **PRESENTATION:**

This part of the introductory lesson (typified by Lesson 1 of this unit) will be modified. The students will **read** for the information, not listen.

5. Tell the students to read the questions on the worksheets to themselves.

6. The teacher reads the questions aloud, reviewing vocabulary in the question the students do not understand.

7. The teacher models how to find the information in the article by doing questions 1 and 2 with the class, writing only the key words or phrases for the answers. Have the students manipulate the article by underlining or circling the answers in the article and writing the numbers of the questions beside the answers.

III. PRACTICE:

8. Assign each student to a partner. Students work together to find the answers and complete the worksheet.

   The teacher circulates to assist the students when needed.

[Self-Monitoring]	*[Inferencing]* *[Resourcing]* *[Note Taking]*	*[Cooperation]* *[Asking Questions]*

IV. EVALUATION:

9. After the students have completed the questions on the worksheet, they present their answers to the teacher. The teacher reads the questions and the students read the answers. The teacher should do this with individual students to prepare for the next lesson in which all the students will summarize individual articles.

[Self-Evaluation]		*[Cooperation]* *[Asking Questions]*

V. FOLLOW UP:

10. The students use the questions and answers on the worksheets to write their summaries of the article.

    This would be an opportune moment to teach sentence combining for questions #2, 7, 8, 10 and 11 which all consist of A & B.

    e.g. #2A. Did Roberta Bondar watch? (no)
    2B. Why not? (too busy working)

Ask:

- How many answers are there in question #2? (2)
- Do you have to write two sentences or could you write one longer sentence?
- How?
- Let's write it together.

  e.g. Roberta Bondar did not watch because she was too busy working.

- What words are you going to use from the question? Underline them! Did Roberta Bondar watch?
- Where will you put "not" in your answer? (after "did," before "watch")
- Why didn't Roberta Bondar watch? (she was too busy working)
- How will you join that to the rest of the sentence? (word)
- What word would you use? (because)
- When you ask "why", do you usually answer with "because"? (yes)

- What is "because"? (discourse marker)
- Instead of repeating Roberta Bondar in the second part of the sentence, what did you use? (she)
- Why? ("she" is for a woman)
- Do we know who you mean when you wrote "she"? (yes)
- How do you know? (said Roberta Bondar at the beginning)
- What is "she" called? (a pronoun)
- What is a pronoun? (takes the place of a noun)
- What noun did "she" take the place of? (Roberta Bondar)

[Deduction/Induction]

11. The students complete their report describing Roberta Bondar's schedule.

[Self-Monitoring]

12. The students give their reports to their partners. They edit them together, making the necessary revisions.

[Self-Evaluation]

[Cooperation]
[Asking Questions]

13. The final draft is presented to the teacher. As the student reads it, the student and teacher edit it together if necessary.

[Self-Evaluation]

EXTENDED ACTIVITY:

Strategy Instruction:

[Resourcing]--

- How did you like working from a newspaper article?
- Was it harder or easier than working from a book?
- Did you understand all the words? (no)
- Was it necessary to understand all the words? (no)
- Did the photograph help you?
- Why did we use the newspaper? (to get more information)
- What strategy are we using when we use other resources? (Resourcing)

[Imagery]--

- Did the picture beside the article help you understand?
- Did watching Roberta Bondar on T.V. last night help you to understand?
- How do pictures help you?
- What strategy on the green sheet are you using? (using images)

[Prediction]--

- Were your predictions accurate?
- What helped you make your predictions? (picture, photographs, title, subtitle, sentence below the photograph)
- Should you always look at these things before you start reading anything? (yes)
- Why?
- What strategy are you using? (Prediction)

[Note Taking]--

- As you were finding the answers what strategy were you doing? (Note Taking)
- We have done note taking before but how was this different? (we didn't listen for the answer; we read the article to find the answer)
- What do you write down when you note take? (key words or important ideas)
- How does this help you? (understand and remember)
- Is your spelling important when you note take as you are reading? (yes)
- Can you monitor what you are writing? (yes)
- How? (by checking the spelling as you are writing it)

[Inferencing]--

- As you were reading and filling in the answers, did you have to guess? (yes)
- When you guess at meanings or answers, what strategy are you using? (Inferencing)
- When did you find out it was correct, or self-evaluate? (when we edited it)
- Were your guesses or inferencing correct most of the time? (yes)

[Selective Attention]--

- What helped you inference or guess correctly? (looked for special words)
- In question #1 what word did you look for? (witness)
- Did that word help you find the answer? (yes, it was in the article, so we knew the answer followed that word)
- What word did you use in question #2? (watch)
- What strategy did we add to the blue sheet which helps us to pay attention to select words? (Selective Attention)

Spacewoman Swamped

1. What did the astronaut on board the Discovery witness?

2.A. Did astronaut Roberta Bondar watch?

B. Why not?

3. How long did it take for the sun to set and rise?

4. What was Canadian astronaut Roberta Bondar doing?

5. How long is Roberta Bondar's workday?

6. What did Roberta Bondar see when she looked out the window?

7.A. What experiment did Roberta Bondar do to Steven Oswald?

B. What was she testing?

8. Besides being an astronaut what is Bondar?

9. How many science experiments is Bondar doing in space?

10.A. What experiment did Bondar do yesterday?

B. How could the results of this test be used?

11.A. How many fruit flies died?

B. How many fruit flies are still alive?

C. What are they observing in fruit flies?

AP PHOTO

Roberta Bondar holds oat seedlings up to a video camera yesterday during an experiment.

EST COPY AVAILABL

Spacewoman swamped

Bondar misses sunrise, sunset

By Laura Eggertson
Canadian Press

WASHINGTON — Astronauts aboard the Discovery witnessed the last sunset and sunrise of their week-long mission yesterday, but Canadian Roberta Bondar was too busy working to watch.

Because of the space shuttle's orbital pattern and the season of the year, the crew watched the sun set and then rise within two minutes, said Randy Stone, NASA's mission operations director in Houston.

For the rest of what Stone called a "picture-perfect mission" so far, the shuttle will be in continuous sunlight if it returns to Earth as scheduled on Wednesday.

But while the sun was dipping and bobbing, Bondar, Canada's first woman and second astronaut in space, was busy freezing cells and watching them separate in spacelab.

Bondar did, however, have time once she finished her 10-hour workday to look out the window for the first time yesterday to see her home from space.

"Well, it's the blue planet," Bondar told alternate Canadian astronaut Ken Money, co-ordinating communications with her.

Money, who expressed his jealousy, said Bondar promised to bring him back "lots of pictures."

Bondar was able to see the Belcher Islands in the southeastern corner of Hudson Bay and some Canadian lakes, Money said.

"She was delighted to see what she could of her own country. I think it came home to her that she was really in a beautiful position and could see something of Canada as a whole," he said.

She also strapped shuttle pilot Stephen Oswald into a rotating chair and set him spinning in an experiment designed to test the effects of zero gravity on astronauts.

"Thank the pilot very much for enduring the unendurable," a NASA ground controller told Bondar from Houston.

"Oh no. He wanted to go for a ride," she joked.

Bondar, a neurologist at Hamilton's McMaster University, works the day shift in the lab tending to the 42 science experiments designed to take lessons from space back to Earth.

The native of Sault Ste. Marie, Ont., ran a University of British Columbia experiment yesterday called phase-partitioning. In the project, scientists are trying to achieve pure separation of cells in micro-gravity.

Some day, the results could be used to try to separate cancerous from non-cancerous cells, said NASA spokeswoman Kathy Kennedy in Huntsville, Ala.

Because of Bondar's shift, she missed the only problem of the mission so far: the death of 240 fruit flies.

The flies are among the millions of creepy-crawly subjects including slime mould, experimental roundworms and fetal mouse bones that share the shuttle with the seven astronauts.

"It's a disappointment for everybody," the European Space Agency's Claude Brillouet, a project scientist, told The Associated Press. "We would have preferred to have flying flies."

Researchers ordered new fly containers about a month before launch because of contamination. When the new boxes arrived, they were sterilized and apparently some of the solution was left on the containers.

"These little flies are very sensitive to this sort of thing," said NASA mission scientist Bob Snyder.

But the astronauts took heart from the presence of the 240 flies still alive, on which they can observe the way the flies and the eggs they laid develop in weightlessness.

Although today is a working day on Discovery, the astronauts will hook up via satellite to the pregame Super Bowl show, said Stone.

They may even flip the coin that decides whether the Washington Redskins or the Buffalo Bills receive the opening kickoff.

Lesson 8: Roberta Bondar (Science, Language Arts)

Objectives:

Content Objectives:

(Dependent upon the actual articles. Refer to the summaries of the articles in the appendix in Lesson 9.)

- To learn about the personal history of Roberta Bondar.
- To understand her family's pride.
- To learn about the importance of the mission, the length of time and the reason for the one day extension.
- To learn about the international experiments, including six Canadian experiments, being conducted in the skylab, e.g. with the body, plants, worms, slime mould, and bacteria.
- To understand how astronauts are human and make mistakes. Reasons for their mistakes and how they are rectified.
- To learn why many astronauts get sick in space.
- To learn some of the difficulties the astronauts experience, e.g.,staying awake, getting twisted, weightlessness, toilet problems, textureless foods, cravings,and the death of 400 fruit flies.
- To understand the highpoints of the mission e.g. beauty of Canada, our planet against the black universe, sunrise and sunset.
- To learn about the stages of landing.

Language Objectives:

Skills:

- Listening - for information and instructions
- Speaking - to give information
  - to ask questions
- Reading - for information
  - to give information during editing
- Writing - summaries
  - descriptive multi-paragraph reports

Linguistic Knowledge:

Vocabulary:

- dependent upon the particular newspaper article.

From Article #1
- memorabilia, brochures, Saturn, Apollo, proud, excited, solid rocket boosters, separate, successful, dot

From Article #2

- shuttle, blast-off, experiments, worms, slime mould, bacteria, human body, reach, robot, float, pressurized, module, spacelab, prepare, samples, crew, adaptations, weightlessness, effect, gravity, explore, human, soaring, creatures, microscopic, roundwords, examine, mutating, radiation

From Article #3

- crew, spinned, coin, twice, traditional, coin toss, weightlessness, heads, tails, extend, mission, save, power, continue, experiments, data, fluid, separation, due to, lack, ruin, film, exhausted

From Article #4

- discouraged, models, hid, fear, ridicule, peers, male, guidance councellor, convince, arts, humanities, courses, concerned, future, selection, incident, typical, prejudice, faced by, conducting, studies, effects, strokes

From Article #5

- sightsee, busy, scientific, shift, dozens, international, carried out, wheat seeds, plant, roots, shoots, break, sled, blindfolded, ear plugs, turns, back and forth, shocks, test, balance, inner ears, nervous systems, medical conference, commander, crew members, two thirds, motion sickness

From Article #6

- beautiful, country, blasted off, excited, wonderful, soaring, boring, difficulties, around the clock, shifts, laboratory, due, return, originally, planned, extra, scientists

From Article #7

- irregular, right stuff, conversation, Prime Minister, described, inspired, high points, trip, able, unity, mankind, lift-off, thrill, struck, beauty, Earth, Blue Planet, description, crisp, shiny, bright, jewel, overwhelmed, twisted, enter, upside down, condition, weightlessness, difficult, anticipated, trip, arriving, tents, camping, setting up, worst

From Article #8

- difficulties, death, fruit flies, percent, successful, EST (Eastern Standard Time), Los Angeles, northwest, orbiting missile, airplane, heat, difference, facing, slightly, warps, shape, payload doors, even out, preparation, spacesuits, software, fed, computer, bolted, into place, fired, enough, bump, out of orbit, twists, turns, rate, immediately, brief, physical examination, poked, measured, urine sample, metabolism, determine, grow, zero gravity, rotating chair, repeat, body, balance, hardly

From Article #9

- mush, cosmonaut, complaints, confess, toilet, textureless, craving, cold skim milk, view, planet, universe, success, based on, carried out, greeted, Museum of Science and Technology, Prime Minister, high school students, wearing, NASA overalls, flag, left, news conference, space voyage, unique, opportunity, perspective, incredible, feeling, super cool, one with the earth

Structures:

- Writing declarative sentences from point form
- subject verb agreement
- present tense
- personal pronouns
- possessive pronouns
- active voice
- passive voice
- prepositional phrase
- making compound sentences using coordinating conjunctions
- Relative clauses
- Punctuation
- capitalization e.g. proper nouns and in sentences.

Discourse Features:

- Paragraph structure
- ordinal numbers when taking notes to clarify sequence, important ideas and details

Functions:

- Summarizing, describing - writing a summary describing Roberta Bondar's activities on board the Discovery.

Learning Strategies:

Metacognitive Strategies:

- Advance Organization (special attention will be paid to teaching this strategy)
- Selective Attention
- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Resourcing
  - Note Taking (without guiding questions)
  - Grouping
  - Summarizing
  - Inferencing
  - Deduction/Induction
  - Elaboration

Social-Affective Strategies:

- Cooperation
- Asking Questions

Materials:

- Several newspaper articles about the space mission: (*Winnipeg Free Press* and The *Globe and Mail*). See the **Appendix to this lesson** for photocopies.

Procedures:

I. PREPARATION:

Discuss the previous newspaper article "Spacewoman Swamped" and Roberta Bondar's workday and mission in space. (If necessary, use some of the questions from the worksheets in Lesson 7 to help them recall the article.)

Review the metacognitive strategy of Advance Organization by asking:

- Where was the article written from? (Washington)
- How do you know? (has Washington written in capital letters)
- Where is Washington? (USA)
- Why was the article written for the Canadian Press in Washington in the United States? (flight left from the United States)
- What was the name of the reporter who wrote the article? (Laura Eggerton)

[Advance Organization]--

- Before you read the article "Spacewoman Swamped," what did you do? (looked at picture or photograph and title)
- Did you look at anything else? (subtitle, sentence under the photograph)
- Did the title tell you what the article was about?
- What does it mean when we say, "Spacewoman Swamped"? (she is busy)
- What was she busy doing? (working)
- Whta kind of work was she doing? (experiments)
- Were these experiments important? (yes)
- What was the subtitle? (Bondar misses sunrise, sunset)
- Why did she miss the sunrise and sunset? (She was too busy working)
- Does that elaborate upon what the title says? (yes)
- How? (She was so swamped or busy with work she missed the sunrise and sunset)
- What was Roberta Bondar doing in the photograph? (oat seedlings)
- What was she doing with the oat seedlings? (experiment)
- How do you know? (It says)
- Where? (below the photograph)
- What does this photograph and sentence have to do with the title? (It tells what she was busy working at - experiments)
- How long is this article? (3 columns)
- How many paragraphs are in this article? (23)
- How did you know there are 23 paragraphs? (Indent)
- Did looking at or previewing the title, subtitle, photograph and sentence in advance or before you read the article help you? (yes)
- How? (helped us predict what the article was about)

- Were your predictions correct?
- How does predicting help you? (think about what it is going to be about)
- It helps you focus.
- If you had another individual article what would be the first thing you would do before you read it? (Look at the title, subtitles, photographs and sentence describing the photograph to guess or predict what the article will be about)
- Does this help you plan how you will learn? (yes)
- This is a strategy. What sheet should we put it on if it helps you plan how to learn? (blue)
- When do we do this previewing? (before we read)
- What is another word for doing something before? (advance)
- What are you looking at in advance? (How the article is put together or organized)
- Do you think we could call the strategy "Advance Organization"? (yes)
- When we say Advance Organization, what do we mean? (looking at the article in advance or before we read it to see how it is organized)
- How does it help you? (to learn by guessing or predicting what the article is about)
- Add Advance Organization to the blue sheet.
- How will you describe it on the blue sheet? (Advance Organization before I read)

[Prediction]--

- What strategy on the green sheet usually goes with Advance Organization? (Predict)
- Why? (because as we are looking at the article we are predicting or guessing what the article is about)
- How does this help you? (Helps us understand the article by paying attention to key words in the story or article before we read it.)

[Selective Attention]--

- When you are paying special attention to key words in the title, subtitles, and sentences, what other strategies are you using on the blue sheet? (Selective Attention)
- How does Selective Attention help you? (helps us learn)
- What three strategies go together to help you learn and understand? (Advance Organization, Selective Attention, and Prediction)
- When do you do these three strategies? (before we read the article or story)

II. PRESENTATION:

- Distribute the individual newspaper articles to the students. Students may choose their articles. However, if an article is difficult (e.g.,there is no photograph) encourage a student who is more proficient in English to take it. On the other hand, encourage students who are less proficient in English to take the shorter articles with photographs. Also supply these students with questions to answer about their article, as was done in the previous lesson.

- Tell the students they have two minutes to use Advance Organization and Selective Attention on the title, subtitles, photographs and sentences to predict what their article is about. They write down their predictions.

Ask:

- When was the first article "Spacewoman Swamped" written? (Sunday, January 26, 1992)
- Let's write your titles on the board in chronological order? (Ask what chronological order means. If they don't know, tell them.)
- Who has the first title?
- What is it?

- As the students read the titles write them on the board or transparency. These titles in their chronological order will be used in another lesson. It will probably be better to write them on a transparency for future reference.

[Advance Organization]
[Selective Attention]
[Prediction]
[Imagery]

Titles of Newspaper Articles

Jan. 23/92	Bondar family in heaven as Roberta rockets into space.
Jan. 27/92	Bondar on first shift in out-of-world lab.
Jan. 27/92	Bondar flips for Super Bowl.
Jan. 27/92	Fearing ridicule, astronaut once hid model rockets.
Jan. 28/92	Canadian plants wheat, comrades try space sled.
Jan. 29/92	Canada stars in shuttle chat.
Jan. 29/92	Astronaut has 'the right stuff'.
Jan. 30/92	Bondar prepares for shuttle's fiery return.
Feb. 18/92	Bondar was 'like mush' during shuttle mission.

Once the titles of the articles are written on the transparency or board, ask:

- What are your predictions?

Listen to each student's prediction and ask:

- Why did you make this prediction?

Discuss each title with the students clarifying the vocabulary.

Discuss today's activity with the class. Each student or pair of students will be making a summary in point form of their individual article without any questions. In other words, they will be note taking without the questions.

Ask:

- How will you do this?
- What do you have to look for when you are writing a summary? (important ideas)
- So first you would go through the article looking for the important ideas.
- What will you look for next? (information about the important ideas - details)
- How will you separate the important ideas from the details? (answers will vary)

Introduce the T-list (Chamot & O'Malley, 1986); see Chapter 3 for explanation.

Important Ideas	**Details**
1. ______________	______________ ______________ ______________
2. ______________	______________ ______________ ______________
3. ______________	______________ ______________ ______________

- Does this make it clearer?
- When you note take your ideas like this into separate columns and classifications, what are you doing? (grouping)

Model the activity for them using a newspaper article and the T-list.

- Number the important ideas first in cardinal numbers, e.g. 1, 2, 3, 4
- List these on the left hand side of the T-list.
- Go through the article and circle the supporting details.
- List the details in the right column beside the important appropriate idea.

[Organizational Planning] *[Resourcing]*
[Note Taking]
[Grouping]
[Summarizing]

III. **PRACTICE:**

The students work individually or in pairs, reading their articles and completing the T-lists. The teacher circulates to assist the students by giving cues as needed.

[Self-Monitoring] *[Resourcing]* *[Cooperation]*
[Note Taking] *[Asking Questions]*
[Grouping]
[Summarizing]
[Inferencing]

IV. **EVALUATION:**

When each T-list is completed, the student and teacher check it together.

[Self-Evaluation] *[Cooperation]*
[Asking Questions]

V. **FOLLOW UP:**

The students use the information in their T-lists to write their summaries, describing Roberta Bondar's activities on board the Discovery in paragraph form.

The teacher and students discuss how to write a report with several paragraphs.

Each numbered item under the important ideas column is a new paragraph. Each point in the details column is a separate sentence within that paragraph.

The teacher models the activity using his/her T-list, integrating all the structures listed in the language objectives in his/her demonstration. This demonstration illustrates how the students have gone from phrase --> sentences --> paragraphs in a report.

[Deduction/Induction]
[Elaboration]

The students write their summaries, edit the first draft with a partner and the second draft with the teacher, and finally write their final draft for a presentation to the class at a later date.

[Self-Monitoring] *[Deduction/Induction]* *[Cooperation]*
[Self-Evaluation] *[Elaboration]* *[Asking Questions]*

Appendix to Lesson 8 - Newspaper Articles

Bondar family in heaven as Roberta

By Calvin Woodward
Canadian Press

CAPE CANAVERAL, Fla — As a secretary for one of NASA's big contractors 25 years ago, Erma Herman thought she was inspiring her niece with the space memorabilia she'd send to her back in Sault Ste. Marie, Ont.

But she never knew Roberta Bondar would take her interest to such an extreme.

Yesterday, she watched as Bondar hurtled into the sky aboard the space shuttle Discovery, living out the dream of a woman whose imagination was ignited by science fiction movies and her Aunt Erma's NASA brochures.

"I never thought I'd see the day when she'd toss in her resume and make it," Herman said from her nearby Titusville home, where 20 members of the Bondar family and close friends gathered after the launch.

At least five busloads of friends, colleagues and acquaintances came down for the liftoff, a spectacular ascent that kept anxious eyes glued skyward for the four minutes until Discovery, then a mere dot, vanished from sight.

"It was just breathtaking today," said Aldona Bondar, wife of Roberta's uncle.

"Tears were running down our faces. Of course, you're afraid something would happen."

The clan included Bondar's mother, who relatives said apparently went on to Huntsville, Ala. Scientists at NASA's Marshall Space Flight Centre there are co-ordinating the experiments that will keep Bondar and the rest of the crew busy for their week-long mission.

From Canada's science minister to the NASA cafeteria workers who doled out lunch amid a happy post-launch clatter, the reaction had a common theme.

Everyone waited for those first two minutes to end, the particularly dangerous minutes of propulsion by the solid rocket boosters before they separate and fall away. In 1986, the Challenger exploded before those two minutes were up, because of a failed booster seal.

rockets into space

"When you hit the two-minute position and you know they've just jettisoned the solid things — ahh — you kind of have an inward sigh," said the minister, William Winegard, who was rattled about from his VIP position during liftoff.

James Bondar, a cousin of Roberta's who grew up with her on the same street in Sault Ste. Marie, agreed.

"The one time it had gone wrong, it had gone wrong before then," he said.

Viewing platforms and buildings through the Kennedy Space Centre shook from the thunder of Discovery's rockets. Less than four minutes later, the dot disappeared.

"It took a while to realize Roberta was a far-off speck," James Bondar said.

Erma Herman came to Cape Canaveral from Sault Ste. Marie via New York. She married a New Yorker and says she started to go by her middle name, Eileen, because New Yorkers kept calling her Oima Hoiman.

She figures Roberta would have ended up an astronaut anyway, even if she hadn't filled her head as a teenager and into her college years with information about the Saturn and Apollo programs.

"I was thrilled when she joined," she said of Roberta's success in signing on with the Canadian Space Agency.

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Bondar on first shift in out-of-world lab

By Calvin Woodward
Canadian Press

CAPE CANAVERAL, Fla. — Discovery thundered into orbit yesterday on a plume of fire and smoke that marked the trail of another Canadian's journey into space.

The space shuttle left 59 minutes late and with a pounding roar to begin a week-long scientific mission starring worms, slime mould and bacteria and featuring some disorienting experiments on the human body.

Family and friends of Canadian astronaut Roberta Bondar were among the anxious, excited observers as Discovery heaved off the pad and arced aloft, reaching orbit in less than nine minutes.

"It was just breathtaking today," said Aldona Bondar, wife of Roberta's uncle. "Tears were running down our faces."

Bondar, 46, of Sault Ste. Marie, Ont., joined in inaugurating the mission's experiments by helping fellow astronaut Norman Thagard of Florida open Spacelab, the laboratory tucked inside Discovery's cargo bay.

The astronauts floated through a chamber from the cabin and crawled into the pressurized module to prepare the live samples for experiments to be done around the clock in two shifts.

NASA fixed a leaky valve on the launch platform, solved a fuel-cell glitch and fretted about cold, clouds and fog before deciding it was warm, clear and safe enough to have Discovery fly.

At 10:52 a.m., ignition brought a brilliant flash and a spreading billow of smoke as the craft's twin rocket boosters and three main engines kicked out their flame.

Just over two minutes later, the boosters fell away as planned and by four minutes, the shuttle was a disappearing dot soaring at 7,000 kilometres an hour, and gaining speed.

The seven-member crew went up with the paraphernalia for six Canadian experiments designed mainly to explore human adaptation to weightlessness.

In one, astronauts are to be moved about on a sled, their seeing and hearing blocked, to study the effect of low gravity on their other senses and their ability to maintain direction and balance.

Up, too, went a variety of slimy creatures.

Among them, millions of microscopic roundworms will be examined for the mutating effects of space radiation on living things.

■ Family in heaven / A8

Bondar waves goodbye as astronauts go to launch site yesterday mornin

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Bondar flips for Super Bowl

NASA may add a day to shuttle trip

By Calvin Woodward
Canadian Press

SPACE SHUTTLE DISCOVERY

AP PHOTO

Canadian astronaut Bondar takes coin for a spin in space shuttle yesterday before game.

WASHINGTON — It came up heads, but the flip before yesterday's Super Bowl was not merely of a coin, but of Canadian astronaut Roberta Bondar.

The traditional coin toss that decides who kicks and receives to start the football classic was preceded by a pre-game toss in space as Discovery's astronauts handed Bondar a coin and sent her slowly spinning in weightlessness.

The brief break from routine in the space shuttle's science laboratory came as NASA pondered extending the mission another day.

The crew dimmed lights and used flashlights to save electricity powering their experiments and permit an eighth day in orbit, with a return Thursday if NASA decides today to go through with the lengthier trip.

"It's all the rage here," Ken Money, the Canadian communicating with the crew, said of the idea.

"We'd be more than happy to stay up," mission commander Ron Grabe replied. But he asked that the crew not be pushed too hard on the final day.

The crew's images were beamed down live to the pre-game Super Bowl show on CBS-TV shortly before the Washington Redskins and Buffalo Bills began play.

Grabe told an estimated international TV audience of 750 million that Bondar "knows a little more about Canadian football than American football but nonetheless she's interested."

Then she clutched a coin and performed two backward flips before being brought to a stop more or less straight up.

"Looks like heads," a CBS commentator said. The real coin toss later in mundane gravity also came up heads.

Bondar, working 12-hour shifts, also tore herself away from her tasks earlier when the flight crew told her that Sault Ste. Marie, Ont., was coming into sight.

She darted, to the extent weightlessness allows darting, to a small window at the rear of the lab and took a fleeting look for her home town 300 kilometres down before going back to work.

NASA said the crew had been frugal enough with energy and water to make possible an eight-day mission.

Landing would still be at Edwards Air Force Base in California, but the vast dry lakebed preferred for the gliding touchdown was ruled out because of recent rain. NASA said a concrete runway there, or at Cape Canaveral, Fla., as an alternative, can safely be used.

"The crew's excited about being able to continue," NASA mission scientist Bob Snyder said from Huntsville, Ala.

But researcher Donald Brooks of the University of British Columbia suggested weariness might have been responsible for the possible loss of data in his fluid-separation experiment aboard Discovery.

Brooks said shuttle pilot Stephen Oswald, helping Discovery's scientists when he was scheduled to be sleeping, opened the back of a camera too soon, possibly ruining some of the film.

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Fearing ridicule, astronaut once hid model rockets

Canadian Press

PETERBOROUGH, Ont. — Canadian astronaut Roberta Bondar was discouraged from taking maths and sciences in high school and felt compelled to hide the model rocket ships she built as a child, says a professor who studies eminent Canadian women.

A guidance counsellor had tried to convince the mother of Bondar, who is currently on a mission on the space shuttle Discovery, to get her daughter to take more arts and humanities courses, says Sylvia Solomon.

The male guidance counsellor probably wouldn't have been concerned about the future astronaut's course selection if Bondar had been a boy, Solomon says.

Bondar also told Solomon she hid her model rockets for fear of ridicule from her peers.

Soloman, a professor at Trent University in this central Ontario community, did her doctorate in philosophy on famous Canadian women.

"I studied women who did reach eminence and what structures needed to be in place for them to reach eminence," said Solomon, who works in the university's concurrent education program.

Solomon has also studied writer June Callwood, black activist Rosemary Brown, NDP leader Audrey McLaughlin, Liberal MP Ethel Blondin, and Senator Lorna Marsden.

"Bondar's case is typical of obstacles successful Canadian women faced to be where they are now."

The 46-year-old astronaut is on leave from McMaster University in Hamilton where she works as a neurologist. She is director of the multiple-sclerosis clinic there and does research at Toronto's Sunnybrook Hospital, conducting studies into the affects of strokes.

Solomon says the incident with the guidance counsellor was typical of the prejudice faced by Bondar, who became the second Canadian astronaut to reach orbit when the space shuttle was launched last week.

Luckily, Bondar's mother says Roberta always knew what she wanted to do.

Sexist attitudes continue, Solomon says, pointing out a Toronto newspaper story that depicted Bondar as cleaning up in space and doing housework.

"Here's this woman who has done all of this and they have her cleaning up in space," says Solomon.

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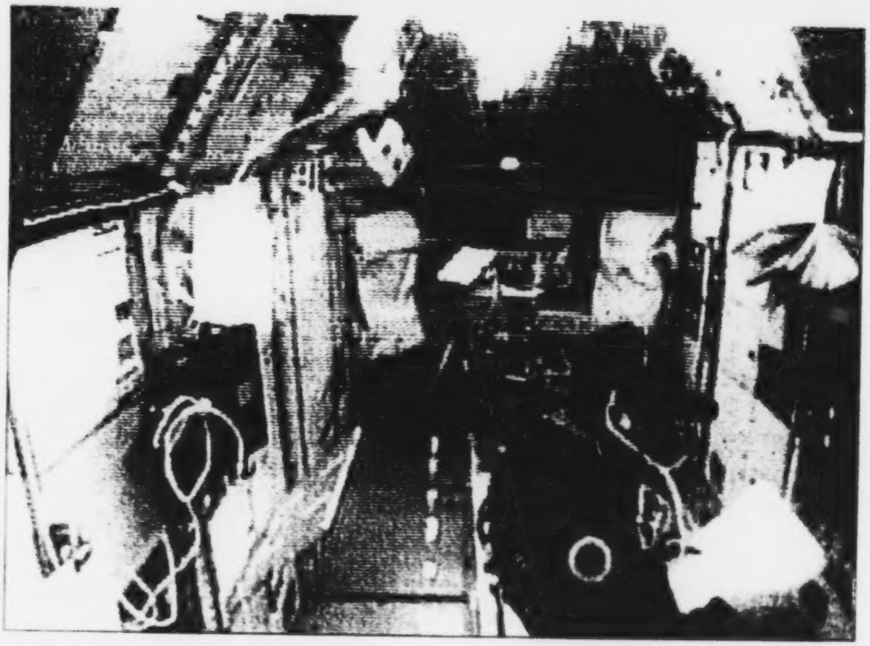

AP PHOTO

Roberta Bondar prepares for an experiment yesterday aboard the space shuttle Discovery.

Canadian plants wheat, comrades try space sled

Gardening aloft part of job for Discovery scientist

By Calvin Woodward
Canadian Press

CAPE CANAVERAL, Fla. — Roberta Bondar gardened in orbit yesterday and companions in the space shuttle Discovery took a short, disorienting ride on a Canadian sled.

As the shuttle whizzed through 90-minute orbits on the second day of flight, its cameras, at one point, showed vivid afternoon views of the rugged Canadian expanse from British Columbia to Hudson Bay.

But Canada's second astronaut in space was too busy working to sightsee.

Bondar did much of the scientific work on the day shift in Spacelab, the module inside Discovery's cargo bay where dozens of international experiments are being carried out.

She planted wheat seeds, studied seedlings planted before launch and showed the tendrils to the Spacelab camera. That brought satisfied smiles from the University of Pennsylvania scientists down below who want to know how roots and shoots grow in space.

"Looks neat," Canadian astronaut Ken Money told her from the NASA ground station where he coordinated communications between research teams and the spacecraft.

Bondar spoke in crisp technicalities and brief courtesies — "OK, I got that — thanks a lot" as she pored over a variety of experiments that will occupy Discovery's two research teams around the clock until the scheduled landing next Wednesday.

NASA science specialist Bob Snyder said experiments are going well despite a few glitches, including a missing pin to hold a microscope in place.

"The crew is doing a marvellous job and the scientists are quite enthused about it," he said.

But McGill University researcher Douglas Watt went through "a moment of great gut pain" when the sled he designed snagged on a data cable critical to several of his experiments.

The night shift astronauts who were conducting his studies managed to pull the cord free, breaking some ball bearings in the sled.

A relieved Watt, speaking from the mission's science-control centre in Hunstville, Ala., said it was incredible that the bearings, not the cable, broke.

Blindfolded and wearing ear plugs, astronauts David Hilmers of the United States and Ulf Merbold of Germany took turns on the sled, which moved them back and forth while a mild electric shock was applied behind their knees.

The idea was to study how the movement affects the balancing capabilities of the inner ear and whether that changes the response of the nervous system to the shock.

Mission commander Ron Grabe called an unscheduled "medical conference" on board, raising questions about whether one or more crew members might be too sick to work.

NASA officials ducked those questions at a briefing except to say two-thirds of astronauts are usually afflicted with motion sickness at first and whatever happened aloft did not affect the work schedule.

Bondar eagerly assented Wednesday when a break was suggested from her post-launch work in Spacelab.

Al Mortimer, chief scientist for the Canadian experiments, said in an interview he didn't know whether Bondar had been ill.

But "she seems to be adapting well today," he said, recalling seeing her chase a pencil around in the orbiter's weightless environment.

Bondar, 46, wore a Los Angeles Dodgers cap that belonged to U.S. astronaut Manley (Sonny) Carter, who had been due to fly in this mission but was killed in a commuter plane crash in April.

Crew members are taking turns wearing the cap in his memory.

NASA, meanwhile, described Discovery's performance as flawless.

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Canada stars in shuttle chat

Bondar effusive in talk with Mulroney

By Calvin Woodward
Canadian Press

WASHINGTON — Prime Minister Mulroney got a plug from space last night on the beauty of Canada's winter, its scientific achievements and the "wonderful things that we share in our culture and our spirit."

Astronaut Roberta Bondar told him she wishes she could "walk across every mile of this beautiful country, because it just looks so exciting from up here."

Her chat with the prime minister, monitored by about 700 young people at the Ontario Science Centre, came as the space shuttle Discovery prepared to wrap up its scientific experiments.

"Your flight has captured the imagination of all your fellow Canadians, probably in a way that you couldn't have imagined," Mulroney said, praising the accomplishment of Canada's second astronaut in space.

Bondar said on one of its 90-minute orbits, Discovery swept across the Northwest Territories, Ontario and Quebec and she noticed the view as she was listening to a version of O Canada on a tape recorded by her piano-playing aunt in Florida.

"I must say that for people who think that our country, when it's winter time, is not exciting, let me tell you it's especially exciting from space," Bondar said.

"I think our country has great potential," she went on, adding Canadians should be happy about the things tying them together.

Discovery's crew ran through yet more experiments, and a U.S. marine on board promised to soldier on through the gruelling pace despite difficulty staying awake.

"This is the can-do crew," Lt.-Col. Dave Hilmers said with a laugh after nodding off on a spinning chair experiment that makes most people sick.

NASA cracked the whip like a drill sergeant to get an extra day's science out of the research teams working around the clock in two shifts in Discovery's laboratory.

The astronauts also paused to remember the crew of the space shuttle Challenger, which exploded six years ago to the day, 73 seconds after launching from Cape Canaveral, Fla., killing all seven people on board.

"It being the 28th, we're all mindful of the sacrifices made along the way," Discovery astronaut William Readdy said. It's the first time a shuttle has been in orbit on an anniversary of the Challenger tragedy.

Discovery is due to return tomorrow, a day later than originally planned.

In a news conference linking Discovery with two NASA ground centres, Bondar told of the excitement she felt when the shuttle blasted off.

"When we actually got to the point of lift-off, it was just absolutely wonderful to be on the mid-deck hearing the flight crew saying, 'mah-velous, mah-velous,'" she said, drag-

→

CP PHOTO

Mulroney applauds yesterday after talking to Canadian astronaut Roberta Bondar, who is aboard Discovery.

ging out "marvelous" like comedian Billy Crystal does in a routine.

She also spoke of the wonder of soaring around the "crisp, shiny, bright jewel" that is Earth.

"When I first came over Canada, it was the biggest thrill imaginable," she said, answering questions in English and French.

"I'm coming back to Earth with a feeling that there's absolutely nothing boring. There is no boring place anywhere in this whole planet."

Hilmers found the scientific workload a tad tedious, however, falling asleep twice on the job. He confessed he found the rotating-chair experiment "kind of relaxing."

NASA chiefs on the ground kept rearranging the schedule to pack in extra work for the benefit of scientists hungry for additional data from the lengthened mission.

"It's been kind of trying down here and I know we've stressed you guys, and I apologize for that," NASA communicator Roger Crouch told Hilmers and German astronaut Ulf Merbold.

Some of the crew have had trouble sleeping, and some film from a University of British Columbia cell-isolation experiment might have been lost because of error by a weary crew member in the taxing environment of space.

"We don't think we're being overworked," payload leader Norm Thagard said.

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The Globe and Mail, Wednesday, January 29, 1992 NATIONAL NEWS

Astronaut has ‘the right stuff’

Bondar tells Mulroney of her ‘fantastic experience’ in space

BY STEPHEN STRAUSS
Science and Environment Reporter

HUNTSVILLE, Ala. — There is more to being Canada's first woman astronaut than 13-hour work days, irregular sleep, and assuming the role of a human coin flip before a Super Bowl game.

In a conversation with Prime Minister Brian Mulroney and journalists last night, Roberta Bondar described the feelings space had inspired in her.

"It's been a fantastic experience. I can't wait to get back to tell people all about it," the 46-year-old native of Sault Ste. Marie, Ont., said.

One of the things she wanted to tell Canadians was that from space she was able to look upon the unity of mankind. "We certainly are all of one planet," she told Mr. Mulroney.

Previously, Mr. Mulroney had told her that she had touched Canadians in ways she could not imagine.

Canadian backup astronaut Ken Money was full of praise for Dr. Bondar, but wryly tweaked the antihero attitude of their country.

"I think in any other country in the world she would be a full-fledged hero, but in Canada we always think of ourselves as rather ordinary people. I think in Canada she will be only a Canadian."

He went on to say, "She is not an ordinary person, but an extraordinary person with enormous amounts of the right stuff."

Earlier in the day during a space-to-earth news conference, a still fresh-looking Dr. Bondar recounted various high points of the trip.

Takeoff was a primal bonding experience. "It was certainly a thrill just sitting there with my colleagues," she said. "We were ready to grasp hands every time they gave us the go [after pauses in the countdown]."

Once aloft, the beauty of the Earth struck Dr. Bondar as it has so many other astronauts. "My impression of the planet Earth is that the title of Blue Planet is a good one," she told reporters as the other members of the space shuttle Discovery's crew watched.

She eschewed the standard reference to a "blue marble," describing her home world as a "crisp, shiny, bright jewel."

When she flew over Canada for the first time, she looked out the window and was overwhelmed. "Winter or no winter . . . it's absolutely beautiful and spectacular. There is absolutely nothing boring. There is no boring place anywhere on the planet."

One of the things that was initially disorienting was going from the mid-deck, where the crew members sleep, to the microgravity laboratory where they work. In the beginning, Dr. Bondar unconsciously got twisted around during her traverse and continually found herself entering the laboratory upside down.

Performing scientific experiments in a condition of weightlessness has also proved to be much more difficult than she anticipated, but she hoped the data from the flight, compiled in what she described as an "open-book examination," would receive "four A's" from the mission's scientists.

Later today and tonight the crew members will pack their space-faring tents and police the area. "A shuttle trip is a lot like a camping trip," National Aeronautics and Space Administration spokesman Brian Welch said. "The best part is arriving, pulling out the tent and setting up. The worst part is trying to get everything back where it belongs. Things just have a tendency to spread all over the place."

Going from space to Earth takes an hour. If everything goes according to plan, Discovery will touch down tomorrow a little after 11 a.m. EST at Edwards Air Force Base in California.

The Globe and Mail, Thursday, January 30, 1992

Bondar prepares for shuttle's fiery return

Canadian astronaut scheduled for more scientific work on Earth

BY STEPHEN STRAUSS
Science and Reporter

HUNTSVILLE, Ala. — It's danger time for a space shuttle mission whose worst news so far has been the death of 400-odd fruit flies and the problem that astronaut David Helmers had staying awake during some rotating chair experiments.

"We've been 96 per cent successful," says Ken Money, the Canadian astronaut who has served as liaison between the astronauts on the shuttle Discovery and scientists on the ground.

Now come the tricky landing manoeuvres. These are supposed to land Roberta Bondar, Canada's second astronaut, and the six other crew members of the shuttle today at 11:07 a.m. EST at Edwards Air Force Base, 135 kilometres northeast of Los Angeles.

Landing is a complicated, time-consuming and dangerous procedure, as Discovery, which has been travelling at 26,000 kilometres an hour, uses Earth's atmosphere as its power brakes.

The first stage of changing the shuttle from an orbiting missile into the world's fastest winged aircraft occurs 15 hours before its five wheels touch the ground.

Because only one side of the shuttle has been facing the sun for its eight-day trip, the heat difference between sides slightly warps the shape of the spacecraft.

Since this slight banana-shaped distortion might make it difficult to close payload doors that are the length of a school bus — if they are open, the shuttle cannot land — Discovery goes into a lazy roll. In what the National Aeronautics and Space Administration amusingly calls "barbecue mode," the ship turns every three or four minutes over a nine-hour period to even out the heat over the craft's squat body.

Within about four hours before landing, an intense period of preparation begins. The payload doors are closed, astronauts get into their spacesuits, landing software is fed to the computers, the chairs for everyone but the commander and the pilot must be taken out and bolted into place.

Ninety minutes before landing, Discovery gets turned so it is in effect travelling backward. The reason for this is that an hour before landing two rockets will be fired briefly.

These do not slow Discovery much — 480 kilometres an hour or so — but it is enough to bump the shuttle out of a stable orbit about 280 kilometres above Earth. The craft enters the atmosphere with its nose up so that the belly takes much of the 1,200-degree heat produced during re-entry.

"When the machine first gets into the upper atmosphere, the machine is basically unstable and requires computerized stabilization," Dr. Money said. ". . . Should that fail, it's a disaster."

For much of the next hour, the shuttle slams through the atmosphere twisting, turning and glowing like a greenish-orange fireball, falling to Earth at a rate of 100 metres a second.

It takes half an orbit of Earth to slow the shuttle from what is called "mega-hypersonic speed" to a more manageable 1,100 kilometres an hour. At somewhere between 25,000 and 33,000 metres, Discovery will begin a U-turn that will bring it roaring onto Edwards' roughly 5,000-metre runway at what seems like a snail's pace of 295 kilometres an hour.

Dr. Bondar will, initially at least, be handled gingerly. She will step into an airport "people mover" and immediately lie down. "It's just easier on them," NASA spokesman Brian Welch says.

The astronauts will undergo a brief physical examination, get their Earth legs, hug their relatives, grab a shower and then almost as quickly go back to work.

The space physiology experiments that have been an integral part of the flight will continue unabated on the ground. Fourteen Canadian researchers in California will be poking and measuring Dr. Bondar and other Discovery crew members within hours of their arrival. The 11 Canadian experiments in this area have taken up one-sixth of the crew's flight time.

A urine sample will be taken by Dr. Howard Parsons of the University of Calgary for a metabolism experiment that will try to answer two questions: Do people burn more energy in space and what might be an optimum space diet?

Peter Wing of the University of British Columbia will measure Dr. Bondar to determine how much she has grown in zero gravity. She will have to redo the B.C. orthopedic surgeon's back bending and twisting experiments.

Canadian astronaut Robert Thirsk will be trying out a decompression suit on pilot Ronald Grabe to see whether it eases some of the blood circulation difficulties caused by the astronauts' sudden re-entry into gravity.

Over the next week, Dr. Bondar and others will repeat sled and rotating chair experiments designed to understand how and why the human body's balance system is thrown out of whack in the absence of gravity.

One person Dr. Bondar will also see is Dr. Money, whom she told during their last space-to-ground conversation: "I can't wait to see you and swap stories. . . . We'll have a baked potato together." Baked potatoes are Dr. Bondar's favourite food.

Bondar was 'like mush' during shuttle mission

By Helen Branswell
Canadian Press

CP PHOTO

Bondar, with the PM, waves to crowd of children yesterday.

OTTAWA — Canadian astronaut Roberta Bondar says she and her colleagues on NASA's latest space shuttle spared but one thought for a Soviet cosmonaut who's been orbiting since last May.

"We hoped that his bathroom worked a little better," Bondar said at a news conference yesterday, her first public appearance in Canada since her historic space mission late last month.

"Ours kind of broke down in flight and we had to use Vise Grips to operate it. Then the Vise Grips floated away one day."

Toilet problems, textureless food and a craving for cold skim milk were the only complaints Bondar confessed to having on her eight-day voyage.

Mostly, the Sault Ste. Marie, Ont., native raved about a trip only 263 other people have ever made.

"The view of our planet and the solitude of this planet against . . . the black universe is something that I shall never forget and is something that I will endeavor for the rest of my life to try to protect," she said.

Bondar, 46, is only the second Canadian astronaut — and the first Canadian woman — to travel in space. Her mission has been called NASA's most successful, based on the results of the experiments carried out.

She and Ken Money, her backup from the Canadian Space Agency, returned to Canada to an official welcome. In addition to their news conference, they were greeted by Prime Minister Mulroney and 200 high school students at the Museum of Science and Technology.

Mulroney quipped that an afternoon appearance of the astronauts in the Commons deprived reporters of a common complaint.

"With Dr. Money and Dr. Bondar in the galleries, for once the Canadian media won't be able to say there are obviously no rocket scientists in the House of Commons."

Sporting blue NASA overalls with a Canadian flag on the left arm, Bondar spoke at the news conference of how the space voyage changed her. She said it was a unique opportunity to put things in perspective.

"To me, it's just incredible that there are some small problems and petty issues that go on that prevent us from enjoying this experience, because this planet is beautiful," she said.

"It seems ridiculous to have divisive things going on anywhere in the world. And it's that kind of feeling that is a gift that I've been given."

She told of looking out over the world as she listened to From a Distance, a Bette Midler song with a spiritual message.

"I cannot tell you what that did to me. It was like: This super cool scientist was up there floating around and was just like mush, at one with this earth, with this music.

"It was the most incredible feeling."

Lesson 9: Roberta Bondar Presentations and Predictions (Science and Language Arts)

Objectives:

Content Objectives:

- To learn about Roberta Bondar and The Discovery mission as stated in the content objectives of Lesson 8.

Language Objectives:

Skills:

- Listening - for important ideas
- Speaking - to give information
  - presenting summaries of the newspaper articles to the class
- Reading - presentations
  - prediction and summaries
- Writing - predictions and summaries

Linguistic Knowledge:

Vocabulary:

- All the vocabulary associated with the individual articles listed in Lesson 8.

Structures:

- Writing declarative sentences
- Subject-verb agreement
- Verb tenses
  - future in the prediction
  - past in the summary

Functions:

- hypothesizing or predicting what the articles are about.
- evaluating their predictions.

Learning Strategies:

Metacognitive Strategies:

- Advance Organization and Selective Attention - using these to make accurate predictions
- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Prediction/Inferencing - checking or evaluating predictions against the presentation of the article
- Resourcing
- Imagery
- Note Taking
- Summarizing
- Transfer

Social-Affective Strategies:

- Cooperation
- Asking Questions for Clarification

Materials:

- The same newspaper articles as the presenters have, which were utilized in Lesson 8 (*Winnipeg Free Press* and The *Globe and Mail*).

Procedures:

I. PREPARATION:

Refer the class to the chronological order of the newspaper articles. This will be the order of the presentations. The students will have practised presenting at home and at school.

Discuss the titles of the presentations to be made that day.

Review the strategies of Advance Organization and Selective Attention to make predictions. Discuss how accurate their predictions were before reading the article; however, do not disclose their predictions at this time.

[Advance Organization]--

Ask:

- Before you read your article what did you do? (looked at the photograph, title, subtitle, and sentence below the photograph)
- Did this help you? (yes)
- How?
- What strategies are you using when you do this? (Advance Organization)

[Selective Attention]--

- When you are using Advance Organization, what are you paying special attention to in the title? (the words)
- In the subtitles? (the key words)

- In the sentence below the photograph? (the important words)
- What strategy are you using when you are paying attention to special or key words? (Selective Attention)

[Imagery]--

- Did your article have a photograph?
- Did the photograph help you?
- How?
- What was below the photograph? (a sentence describing what was happening in the photograph)
- Did the photograph help you to understand the article?
- What strategy were you using? (Imagery or pictures)

[Prediction]--

- Once you used these strategies what did you do? (predict)
- Did predicting what the article was about help you?
- How?
- How accurate was your prediction?

Roberta Bondar Presentations and Predictions

1. January 23/92 - Bondar family in heaven as Roberta rockets into space.

PREDICTION: ______________________________

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SUMMARY: ______________________________

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2. January 23/92 - Bondar on first shift in out-of-world lab.

PREDICTION: ______________________________

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SUMMARY: ____________________

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3. January 27/92 - Bondar flips for Super Bowl.

PREDICTION: ____________________

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SUMMARY: ____________________

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4. January 27/92 - Fearing ridicule, astronaut once hid model rockets.

PREDICTION: ____________________

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SUMMARY: ____________________

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5. January 28/92 - Canadian plants wheat, comrades try space sled.

PREDICTION: ____________________

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SUMMARY: ____________________

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6. January 29/92 - Canada stars in shuttle chat.

PREDICTION: ____

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SUMMARY: ____

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7. January 29/92 - Astronaut has 'the right stuff'.

PREDICTION: ____

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SUMMARY: ____

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8. January 30/92 - Bondar prepares for shuttle's fiery return.

PREDICTION: ____

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SUMMARY: ____

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9. February 18/92 - Bondar was 'like mush' during shuttle mission.

PREDICTION: ____

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SUMMARY: ____

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II. **PRESENTATION:**

Distribute worksheets with the chronological order and titles of the newspaper articles. Ask the students:

- What do you think we are going to do? (make predictions)
- How do you know? (It says "prediction")
- What do you need to make an accurate prediction? (articles)
- Why isn't the title enough? (need more information)
- Could you make a prediction from just the title? (yes)
- If I give you the article how will it help you? (make more accurate predictions)
- What will you look at? (title, subtitles, photograph and sentence below the photograph)

[Advance Organization]
[Selective Attention]
[Organizational Planning]

[Prediction]

- What else will you be doing? (writing down what the article was about)
- How do you know? (It says summary.)
- Will you write everything?
- What do you think you will be listening for? (our predictions)
- You will be listening for information which will tell you if your prediction was right.

[Selective Attention]
[Organizational Planning]

[Transfer]

III. **PRACTICE:**

Distribute copies of the article being presented to the class. The students are given two minutes to make their predictions on the worksheet. The teacher may assist them with their first predictions for the first presentation. The articles are turned face down during the presentation.

The presenter reads the summary of his/her newspaper article. As the presenter reads, the students listen for verification of their predictions. When the presenter has finished presenting, the students write what the article was about in one sentence (summary).

[Advance Organization]
[Selective Attention]
[Self-Monitoring]

[Resourcing]
[Prediction]
[Imagery]
[Note Taking]
[Summarizing]
[Transfer]

Assign students to a partner or a group. Set a time limit of three minutes for the students to compare and correct their answers with each other.

[Self-Evaluation]

[Cooperation]
[Asking Questions]

IV. EVALUATION - Speaking, Listening:

The presenter tells the class his/her prediction and students tell their predictions. The presenter asks the students what the article was about. The presener writes one sentence on the overhead or board to summarize the article. The students check their answers for accuracy and spelling against the presenter's.

[Self-Evaluation]

[Cooperation]
[Asking Questions]

This process is followed for each presentation.

V. FOLLOW UP - Strategy Instruction:

(Questions and answers will vary with each article but here is a sample.)

[Selective Attention]-- *[Prediction]--*

- How accurate were your predictions?
- Did the predictions help you?
- How?
- When you were listening what were you listening for? (our predictions)
- How did you know when your predictions were correct? (heard the words)
- Were you listening for the special words you wrote in your predictions? (yes)
- What strategy is this? (Selective Attention)

[Advance Organization]-- *[Resourcing]--*

- Did it help you when I gave you the actual article to predict? (yes)
- How? (It gave us more information)
- Where? (title, subtitle, photograph)
- When you are looking at the title, subtitle, and picture or photograph before the activity, what strategy are you using? (Advance Organization)
- When you use a resource like a newspaper for information, what strategy are you using? (Resourcing)

[Note Taking]--
[Summarizing]--

- When you were listening what were you listening for? (predictions)
- When you wrote your sentence about the article, what were you writing? (a summary)
- What strategy were you doing? (summarizing)
- Were you note taking when you wrote your summary? (yes)
- How? (listened for important ideas)

- How was this note taking different from other note taking we have done? (listened for our predictions)
- Did this focus you more?
- Why? (only listening to prove one thing)

Additional Information:

1. January 23/92 - Bondar family in heaven as Roberta rockets into space.

Special aunt - Aunt Erma
Why? Sent her things from NASA
Who came? family
How many? 20 members
Felt - proud and excited
Saw - Blast off until a dot in space

2. January 23/92 - Bondar on first shift in out-of-world lab.

When? - the day before, January 22/92
How late - 59 minutes
Blast off time - 10:52 A.M.
Length of time to reach orbit - less than 9 minutes
Length of mission - week
Mission - experiments
Experiments - worms, slime, mould, bacteria and on the body.
How many Canadian experiments? - 6

3. January 27/92 - Bondar flips for Super Bowl

Flipped who? Roberta Bondar
How? - coin in her hand twice
Won? heads
Extending - the mission 1 day
Why? - continue experiments
Mistakes - due to lack of sleep

4. January 27/92 - Fearing ridicule, astonaut once hid model rockets

Discouraged from - taking maths and science
Hid - models and rockets
Why? - ridiculed by peers
Concerned over courses
Selection - she was a girl
Typical of: prejudice
Today in space: experiments

5. January 28/92 - Canadian plants wheat, comrades try space sled

Scientific work
When? day shift
Where? space lab
What? dozens of international experiments
Planted - wheat seeds
Why? - see how roots and shoots grow in space
Break - Wednesday
Other astronauts tried - space sled
Why? - to test the balance of their inner ears and nervous systems
Medical conference - astronauts sick
What? motion sickness

6. January 29/92 - Canada stars in shuttle chat

Who? - Prime Minister Mulroney
What? - Canada - beautiful country
Felt - excited
Difficulty with experiments - staying awake
Shifts - 2
Length - around the clock
Return - a day later
Why? - extra day of experiments

7. January 29/92 - Astronaut has 'the right stuff'

First - Canadian woman
Workday - 13 hours
High points - 1) lift off
- 2) beauty of earth - the Blue Planet
- 3) home - crisp, shiny bright jewel
- 4) overwhelmed looked out the window
Difficulties - 1) twisted
2) weightlessness
Shuttle trip like - camping trip
best part - arriving and setting up
worst part - packing up

8. January 30/92 - Bondar prepares for shuttle's fiery return

Difficulties - 1) death of 400 fruit flies
2) staying awake
Successful - 96%
Landing - January 30/92
Time - 11:07 A.M. E.S.T.
Location - Edwards Air Force Base
Speed of Travel - 26,000 km/hr.
Stages of Landing:

1. 15 hours before - changes from a missile to an airplane
2. For 9 hours - ship turns every 4 minutes
    Why? - to even out the heat.
3. 4 hours before -
    a) astronauts get into space suits
    b) landing software is fed into the computer
    c) chairs bolted into place
4. 90 minutes before - Discovery turned and is travelling backwards.
5. 1 hour before - two rockets fired
    Why? to bump the shuttle out of orbit.
6. Next hour - twists and turns to earth
    speed - 100 meters 1 second

After landing:
Dr. Bondar -
- 1) lie down
- 2) physical exam
- 3) work - more experiments on Dr. Bondar

9. February 18/92 - Bondar was 'like mush' during shuttle mission

3 complaints:
- 1) toilet problems
- 2) textureless food
- 3) craving cold skim milk

Never forget - our planet against the black universe

Success based upon: results of experiments
Spoke where? - news conference
How it changed her:
- 1) Put things in perspective
- 2) beautiful planet
- 3) incredible feeling - like mush

Lesson 10: The Dream Is Alive (Science)

Objectives:

Content Objectives:

- To understand and experience what it feels like to be on a space mission.

Language Objectives:

Skills:

- Listening - for specific information
- Speaking - to give information
- Reading - information from note taking
- Writing
  - a summary
  - a descriptive report (optional)

Linguistic Knowledge:

Vocabulary:

- Kennedy Space Center, Florida, destination, Edwards Air Force Base, California, career astronauts, specialists, fields, journey, medicines, deploy, repair, extend, solar array, tap, energy future, space station, shores, threshold

Structures:

- Answering "wh" questions
- Future tense
- Present tense

Functions:

- To write a summary in point form
- To write a descriptive report (optional)

Learning Strategies:

- Although the strategies are evident throughout this lesson, it is not necessary to elaborate upon them. The main purpose of the lesson is the enjoyment of the video and the feelings it will arouse in the students.

Metacognitive Strategies:

- Advance Organization
- Organizational Planning
- Selective Attention
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Resourcing
- Grouping
- Note Taking
- Summarizing
- Imagery
- Auditory representation
- Elaboration
- Inferencing

Social-Affective Strategies:

- Cooperation
- Questioning for Clarification

Materials:

- Video (37 minutes) - **The Dream Is Alive**, distributed by Finley-Holiday Film Corporation, Box 619, Whittier, CA 90601, 1985, Smithsonian Institute/Lockheed Corporation
- Summary outline

Procedures:

I. PREPARATION:

Discuss Roberta Bondar's experience in space.

Ask:

- Who was on board the Discovery? (international specialists and astronauts from many countries)
- How long did it take the Discovery to reach its orbit? (less than 9 minutes)
- Why did the Discovery and Roberta Bondar go into space? (to do experiments)
- What were some of the difficulties the astronauts experienced? (lack of sleep, getting twisted, weightlessness, getting sick, making mistakes, etc.)
- What were the high points for Roberta Bondar? (beauty of Canada, our planet against the black universe, sunrise and sunset)
- Where did the Discovery lift-off? (Florida)
- Where did the Discovery land? (California)

[Advance organization]--

(Discussing the events on the Discovery parallels the events shown in the video.)

II. PRESENTATION:

- Distribute the worksheet.
- Tell the students they are going to watch a video called **The Dream is Alive**, and will note-take to complete the worksheet.
- They are familiar with the process and do not need any further explanation.
- Show the video as they note take.

[Organizational Planning]
[Selective Attention]
[Self-Monitoring]

[Resourcing] (video)
[Note Taking]
[Summarizing]
[Imagery] (of the video)
[Grouping] (answers where they belong)
[Inferencing]
[Auditory Representation]
[Elaboration]

Auditory Representation - playing back the word in their minds as they write it.
Elaboration - knowing what Roberta Bondar experienced to feeling what she experienced.

III. PRACTICE:

- When the video is over, assign the students into groups. Appoint a leader to each group. They compare and correct their information from their note taking.

[Self-Evaluation]

[Cooperation]
[Questioning for Clarification]

IV. EVALUATION:

- Correct the summaries with the students. The students give the teacher the correct information and the teacher completes the summary on a transparency.

[Self-Evaluation]

[Cooperation]

V. FOLLOW UP: (Optional)

- They could use the summary to write a descriptive report.
- Discuss the feelings the students experienced during the video. Compare their feelings to those of Roberta Bondar.

The Dream Is Alive

Who?

1. (career astronauts)
2. (other specialists from many fields and countries)

Where:

1. Launch or lift-off? (Kennedy Space Center in Florida)
2. Destination? (space)
3. Landing? (Edwards Air Force Base in California)

How?

1. How far? (journey 3,000,000 miles)
2. How fast? (17,000 miles/hour; circle earth every 90 minutes)

Why important?

1. (experiments)
2. (develop new medicines in 0 gravity)
3. (deploy satellites)
4. (repair satellites)
5. (to extend a solar array to tap the sun's energy for a future space station)

What this proves?

(We can work in space)

Future:

1. (We will travel in space.)
2. (Our children will live in space.)
3. (Their children may be born in space.)

"Like (Columbus) we dream of distant (shores) we have not yet seen. Now that we know how to (live) and (work) in (space) we stand at a threshold of a (new) (age) of (discovery)."

The Discovery: Roberta Bondar

Learning Log - Lessons 6-10

VOCABULARY:

Space Nouns

___ astronaut
___ asteroids
___ Big Dipper
___ cargo bay
___ comet
___ crew
___ danger
___ discovery
___ eclipse
___ galaxy
___ gravity
___ launch pad
___ living quarters
___ meteor
___ mission
___ motion sickness
___ rocket
___ spacecraft
___ space lab
___ space laboratory
___ space shuttle
___ spacesuit
___ star
___ sunrise
___ sunset
___ telescope
___ weightlessness

Note: Other vocabulary items associated with the individual newspaper articles in Lessons 8 & 9 are not listed in this learning log.

Science Nouns

___ cells
___ disease
___ effects
___ energy
___ experiment
___ fruit flies
___ medicine
___ neurologist
___ results
___ specialists
___ test

Other Nouns

___ explorer
___ fields
___ journey
___ ship
___ shore
___ threshold
___ transportation
___ unknown
___ voyage
___ workday

Adjectives

___ cancerous
___ non-cancerous

Verbs

___ deploy
___ develop
___ explode
___ extend
___ freeze
___ lift-off
___ observe
___ repair
___ rotate
___ sank
___ separate
___ spin
___ swamped
___ tap
___ witness

CONTENT:

I can:

_______ Identify the parts of a rocket.
_______ Compare explorers and astronauts.
_______ Understand and explain Canada's contribution.
_______ Explain the importance of the science experiments conducted in space.

LANGUAGE:

I can:

_______ Write a report describing the lift-off.
_______ Write a descriptive report from a newspaper article using guided questions.
_______ Write a summary from a newspaper article using a T-list.
_______ Make a presentation.

LEARNING STRATEGIES:

I can:

_______ Use what I know about planets to help me understand the space program.
_______ Use newspapers as a resource of information.
_______ Use television as a resource of information.
_______ Note take with guiding questions.
_______ Note take with a T-list.
_______ Predict what newspaper articles are about.
_______ Evaluate my predictions.
_______ Use selective attention to make accurate predictions.
_______ Use grouping to summarize information.

Lesson 11: The Space Race (Science, History, Language Arts)

Objectives:

Content Objectives:

- To understand the space shuttle Discovery in relation to other space shuttles.
- To learn about the history of the space race.

Language Objectives:

Skills:

- Listening - for information
  - for instructions and directions
- Speaking - to give information
  - when working with partners
- Reading - for information to answer "wh" questions
- Writing - a summary in point form

Linguistic Knowledge:

Vocabulary:

- all the vocabulary used in the chosen resources. In this case:
  manned, spacecraft, moon rover, skylab, survive, space walk, proves, U.S.A., United States, astronaut, U.S.S.R. - Russia, cosmonaut, space shuttle, circled, ozone layer, race

Structures:

- point form
- capitalization of proper nouns
- past tense
- prepositions
- commas
- plural forms - "s" morpheme

Functions:

- Summarizing information in point form, in answering "wh" questions.

Learning Strategies:

Metacognitive Stategies:

- Advance Organization
- Selective Attention

- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies

- Predicting
- Imagery
- Resourcing
- Note Taking
- Grouping
- Summarizing
- Inferencing
- Deduction/Induction

Social-Affective Strategies:

- Cooperation
- Asking Questions for Clarification

Materials:

- Any book about space. We used:
  Gallant, Roy A. (1986). *National Geographic Picture Atlas of Our Universe.* Washington, DC: National Geographic Society, pp. 272-277. These pages contain pictures and descriptions highlighting the major events of the space race.
- Atlases
- Magazines, e.g.,*Astronomy*

Procedures:

I. PREPARATION:

Discuss the importance of Roberta Bondar and the Discovery. Refer the students to the book (Gallant, 1986, pp. 272-277) or other resource and ask:

- When did the space race start? (1903)
- What is a race? (When two people are trying to win)
- What would a space race be? (a race in space)
- How would you race in space?
- Why would there be a race in space?
- Would the race be between people or countries? (countries)
- Looking at the articles, which two countries is the race between? (Russia and U.S.A.)
- Let's look in the atlas for these two countries.
- Why these two countries? (super powers)
- What is the person who goes into space in the United States called? (astronaut)
- What is the person who goes into space in Russia called? (cosmonaut)
- If you read the word, "America" in the book, where is this astronaut from? (the United

States)

- If you read the word "Soviet" in the book, where is the cosmonaut from? (Russia)
- Now, cosmonauts would be called Russian not Soviet. "Soviet" comes from U.S.S.R. - Union of Soviet Socialist Republics, but it no longer exists. Does anyone know why? (In the summer, August, 1991, the U.S.S.R. had a revolt and collapsed. It is now called Russia.)

Strategy Instruction:

[Advance Organization]--

- Look through pages 272-277; what do you see? (title, dates, photographs, paragraphs)
- What is the first date? (1903)
- What is the last date? (1986)
- Why is it only to 1986? (When the book was printed)
- Let's look.
- What do you think these pages are about? (space race, important dates in the space race)
- What strategy have you used to predict? (Advance Organization)

[Imagery]--

- Look on page 273 under the date 1957 *October*. What is in the photograph? (a dog)
- What is the dog doing? (sitting in a funny chair)
- Why would there be a photograph of a dog? (Russia sent a dog into space)
- Are there several photographs? (yes)
- Why have these photographs been included? (to help us)
- How do photographs help you? (help us understand)
- How? (When we look at the photograph or picture we know what the words are about.)
- What strategy are you using when you use photographs to help you understand? (picture or imagery)
- When you choose a book which would you rather have - one with many photographs or one with only a few? (many)
- Why? (makes the book easier to understand)

[Resourcing]--

- What are we using to get our information? (books, magazines)
- Where did we get these? (from the library)
- When we use other reference materials or resources, what strategy are we using? (resourcing)
- What does resourcing give us? (extra information)
- Let's look at the dates and write down only the dates, with the astronauts and cosmonauts. However, we will start with the dog because it was the first living creature in space.

Go through the pages and write the dates on the board, in sequential order.

- Use other resources (e.g. space magazines) to get dates to the present time. This has been done in this exercise to March 1992.

[Advance Organization]
[Selective Attention]

[Imagery]
[Prediction]
[Resourcing]

II. PRESENTATION:

Once the dates have been written on the board, distribute the worksheets. Have the students copy the dates from the board, in sequential order, beside the word "When?" on their worksheets.

- What is the title?
- What is a time line? (dates in sequential order of events)

The Space Race Time Line

When? e.g., November, 1957

What country?

Who?

Where?

Why?

When?

What country?

Who?

Where?

Why?

etc.

Discuss the worksheets.

- How many worksheets do we have? (4)
- Let's check to see where you have written the dates.
- Ask the students to give you the dates on the overhead in sequential order.
- What did the word "When?" on the worksheet answer? (date, time)
- Look at the worksheets, what do you see? (What country? who? where? why?)
- What do you think it means?
- Let's do the first one together. e.g.:

When: November, 1957
What country? Russia (U.S.S.R.)
Who? Laika - the dog, Sputnik 2
Where? orbit in space
Why? proved life can survive in space

[Organizational Planning]

[Inferencing]
[Note Taking]
[Grouping]
[Summarizing]
[Deduction/Induction]

Strategy Instruction:

[Deduction/Induction]--

Model how to complete the first date by asking these questions for:

"What country?"

- What do we write beside "What country?" (where it was from)
- In most cases what will the country be? (Russia or U.S.A.)
- When you write these countries what do you have to remember they start with? (capital letters)
- Why? (name of a special place)
- What kind of noun is it when we name a particular person, place or thing? (proper)
- When you write "U.S.A." what do you have to remember to put after each letter? (period)
- Why? (abbreviation)
- What is it abbreviated or short for? (United States of America)
- What is the abbreviation for Canada? (Can.)

"Who?"

- What do you put beside "who?"? (astronaut or cosmonaut and mission)
- When you write the names, what do you have to remember? (capital letters)
- Why? (proper nouns)
- If you are listing 3 or 4 names, what do you have to put between the names? (commas)
- Why? (to separate them)

"Where?"

- What do you write beside "where?"? (where it went)
- What did you write for "where?" in 1957? (orbit in space)
- Sometimes it will be different, like on the moon or around the moon. In, on and around answer "where".
- Do you know what these little joining words which answer "where" are called? (prepositions)

"Why?"

- What will you write beside "why?"? (why it is important)
- What did you put beside "why" for 1957? (proved life can survive in space)
- Why did you put "proved"? (It already happened.)
- Did all these dates already happen? (yes)
- So what do you have to remember to write in? (past tense)
- How do you write past tense? (add "ed" to action or verb)
- Do you add "ed" to all verbs?
- What about drive? (drove)
- Some verbs are irregular; remember, the word changes for these.

[Note Taking]--

- What strategy are you doing as you fill in these worksheets? (Note taking)
- How will note taking help you? (remember the information)

[Grouping]--

- Do you understand what to write where? (yes)
- How?
- What will you write beside "Who?"? (the name of the astronaut or cosmonaut and mission)
- Why? (It belongs there)
- What strategy are you using when you write information where it belongs? (grouping)

[Inferencing]--

- As you are note taking and grouping the information, what are you making? (intelligent guesses)
- When you make an intelligent guess, is it usually correct? (yes)
- Does this help you to complete the worksheets? (yes)
- What strategy are you using when you make intelligent guesses to complete the missing parts? (inferencing)

[Summarizing]--

- Once you have completed a section on one date, what do you have? (a summary)
- Which is easier to study - the book or your summary? (summary)
- Why? (only the important ideas or facts)
- What strategy is that? (summarizing)
- How does summarizing help you? (remember the facts)
- What is a time line? (a summary of events)
- What is the space race time line? (a summary of events in the space race)
- Do you ever use time lines in any other subject? (history)
- Do you think writing a time line like this would help you in history? (yes)
- How would it help you? (understand and remember dates and events)

III. PRACTICE:

- Tell the students to work in pairs to complete the worksheets.

[Self-Monitoring]

[Inferencing]
[Note Taking]
[Grouping]
[Summarizing]

[Cooperation]
[Asking Questions]

IV. EVALUATION:

- Once the worksheets have been completed, one pair compares their summaries with another pair checking for:
  - correct information
  - correct spelling
  - capitalization
  - commas

[Self-Evaluation]

[Deduction/Induction]

[Cooperation]
[Asking Questions]

V. FOLLOW UP:

The teacher puts the transparencies on the overhead and the students provide the teacher with the correct answers.

[Self-Evaluation]

[Deduction/Induction]

The Space Race
Time-Line

When?

November, 1957:

What country? Russia
Who? Laika, the dog - Sputnik 2
Where? orbit in space
Why? proved life can survive in space

April, 1961:

What country? Russia
Who? Yuri A. Gagarin - Vostok 1
Where? once around Earth
Why? first man in space

May, 1961

What country? U.S.A.
Who? Alan B. Shepard - Freedom 7
Where? in space
Why? first American in space

February, 1962:

What country? U.S.A.
Who? John H. Glenn, Jr. - Friendship 7
Where? in orbit
Why? circled the Earth 3 times

June, 1963:

What country? Russia
Who? Valentina Tereshkova - Vostok 6
Where? in orbit - 48 times
Why? first woman in space

March, 1965:

What country? Russia
Who? Alexia Leonov - Voskhod 2
Where? in space
Why? first space walk - 10 min.

June, 1965:

What country? U.S.A.
Who? Edward White II - Gemini 4
Where? in space
Why? first U.S. space walk - 21 min.

December, 1965:

What country? U.S.A.
Who? Frank Borman and James Lovell, Jr. - Gemini 7
Where? in orbit - 206
Why? 14 days in space proved they could go to the moon

December, 1968:

What country? U.S.A.
Who? Apollo 8
Where? around the moon
Why? first manned spacecraft to orbit the moon

July, 1969:

What country? U.S.A.
Who? Neil Armstrong, Edwin Aldrin, Jr. Apollo II
Where? on the moon
Why? first walk on the moon

July, 1971:

What country? U.S.A.
Who? David Scott, James Irwin - Apollo 17
Where? on the moon
Why? drove the first moon rover

May, 1973:

What country? U.S.A.
Who? Anita, Arabelle - spiders - in Skylab
Where? in space
Why? first skylab - experiments

April, 1981:

What country? U.S.A.
Who? Columbia
Where? in space
Why? first space shuttle

October, 1984:

What country? Russia
Who? Salyut 7
Where? in space
Why? 237 days in space

January 28, 1986:

What country? U.S.A.
Who? Challenger
Where? in the sky
Why? exploded

January, 1992:

What country? U.S.A.
Who? Roberta Bondar - The Discovery
Where? in space
Why? experiments

March, 1992:

What country? U.S.A.
Who? Atlantic
Where? in space
Why? experiments on the ozone

Lesson 12: The Space Race Time Line (Science, History, Language Arts)

Objectives:

Content Objectives:

- To understand the history of the space race.
- To practice using sequential order of the events in a time line.
- To demonstrate how new missions built and elaborated upon the discoveries of previous missions.

Language Objectives:

Skills:

- Listening - for information
- Speaking - to give information
- Reading - summary in point form
- Writing - a brief paragraph

Linguistic Knowledge:

Vocabulary Development:

- The same as the previous lesson 11.

Structures:

- Nouns in apposition (e.g. Laika, the dog from Russia)
- Compound predicates
- Capitalization of proper nouns
- Punctuation
- Past tense
- Paragraph formation - indent
- Prepositions
- Conjunctions

Discourse Markers:

- Ordinal numbers to mark sequential order

Functions:

- Describing and summarizing
- Writing a summary in the form of a brief paragraph, from information in point form, describing the events of a particular date.

Learning Strategies:

Metacognitive Strategies:

- Advance Organization
- Selective Attention
- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Deduction/Induction
- Elaboration
- Transfer
- Summarizing
- Imagery

Social-Affective Strategies:

- Cooperation
- Asking Questions for Clarification

Materials:

- The Space Race Time Line Summary in point form from the previous lesson
- Blank paper
- Construction paper
- Felt pens
- Ruler
- Glue

Procedures:

I. PREPARATION:

- Review the Space Race Time Lines, discussing how new missions were dependent upon the discoveries of the previous missions. The students refer to their completed point form time lines from the previous lesson as the teacher asks:
    - When did the first living thing go up into space? (Nov. 1957)
    - What country? (Russia)
    - Who went up? (Laika, the dog)
    - What was the name of the mission? (Sputnik)
    - What did this prove? (life could survive in space)
    - How long was it before the next space mission? (4 years)
    - When was the next mission? (April, 1961)
    - What country? (Russia)

- Who went up? (Yuri A. Gagarin)
- What was the name of this mission? (Vostok 1)
- Where did he go? (once around the Earth)
- Why is this important? (first man in space)
- Why did Russia wait 4 years before sending up a person? (Didn't know if he could live.) (Needed time to prepare the mission etc.)
- Why didn't they send Yuri Gagarin in space in 1957? (might not come back)
- Did they feel they had the technology to send up a person in 1957? (no)
- What helped them to get the technology? (the 1957 mission)
- How? (the information and data they got from the 1957 mission)
- Was there any other mission where they sent up creatures before they sent up people? (May 1973 - 2 spiders in Skylab - U.S.A.)
- Why was this important? (first experiments in a skylab)
- What did Roberta Bondar do in space? (experiments in a skylab)
- Do you think the mission in 1973 had anything to do with her mission? (yes)
- How?

Let's go back to 1961.

- In April Yuri Gagarin from Russia orbited the Earth once.
- Who went up in May 1961? (Alan B. Shepard)
- Where was he from? (U.S.A.)
- How long after the Russian mission was the American mission? (1 month)
- Do you think the Russian mission influenced the American mission? (yes)
- Why? (space race)
- When the Americans orbited the Earth, how many times did they orbit? (3 times)
- When? (Feb. 1962)
- How long was that after the Russian mission? (1 year)
- Why didn't they do it sooner? (didn't know how)

Continue discussing the summary through questioning by comparing the Russians and Americans with respect to their accomplishments, relating them to the previous accomplishments from the previous missions.

[Advance Organization]--

- Previewing the main ideas in their point form summaries in preparation for the writing of their paragraphs.

II. PRESENTATION:

Today we are going to use this information from our summaries to write a Space Race Time Line in paragraph form.

Ask:

- Do you remember what a time line is? (sequence of dates and events)

- What is the space race time line? (sequence of dates and events in the space race)
- How many dates do we have listed in our summaries? (students count - 17)
- How many dates will we have in the time line? (17)
- How will we write the dates in the time line? (sequential order)
- What date will we start with? (1957)
- Will you leave it in point form? (no)
- How will you write it? (sentences --> paragraph)

Let's do the first one - 1957.

- What will we write first? (the date - "when")
- What will we write second? ("who" went up)
- What will we write third? ("what country" they were from)
- What will we write fourth? ("where" they went)
- What will we write last? ("why" it was important)
  e.g. In November, 1957, Laika, the dog from Russia, went up into space and proved life could live in space.

Let's write it:

[Deduction/Induction]--

- Discussion as you write it.
- What do we have to remember to do to the first line in the paragraph? (indent)
- Why? (new paragraph)
- What do we write first? (the date) Give me the specific date. (In November, 1957)
- What do you have to remember to write on the first letter of November? (capital N)
- Why? (proper noun - particular month)
- What do you put after November to separate the month from the year? (comma)
- What do you put after 1957 to separate the date from the rest of the sentence? (another comma)
- What do you write second? (who?)
- Give me the information. (Laika, the dog)
- How do you write the L? (capital)
- Why? (proper noun - particular dog)
- What do you put between Laika and the dog? (comma)
- Why? (to separate the name from what it was - a dog)
- What do we write third? (what country)
- What country was the dog from? (Russia)
- What word would you put before Russia to link it to dog? (from)
- What is this little joining word called? (preposition)
- Let's write it. (from Russia)
- What do we put after Russia to separate it from the rest of the sentence? (comma)
- What do we write fourth? (where they went)
- Where did Laika go? (into space)
- What is the preposition in this phrase? (into)
- What verb tense will you write it in if it happened in 1957? (past tense)

- What will you write? (went up into space)
- What was the verb? (went)
- He went into space but today we __?__ (go into space)
- Went is the past tense for the verb? (go)
- What do we write last? (why it is important)
- Why is Laika important? (proved life can live in space)
- How will we join this to the sentence? (use "and")
- "And" is a conjunction. What does a conjunction do? (joins or connects sentences)
- What tense do we write the verb in? (past tense)
- How? (add -ed to "prove")
- Let's write it. (and proved life could live in space)
- What do we put at the end of the sentence to show it is over? (period)

[Selective Attention]
[Organizational Planning]

[Deduction/Induction]
[Elaboration]
[Transfer]
[Summarizing]

III. PRACTICE:

Each student chooses a date on the time line to write a brief paragraph about. If there are fewer students than dates, each student could do more than one date.

IV. EVALUATION:

When the students' paragraphs have been completed, each student edits it with a partner. He/she makes the necessary revisions.

Each paragraph is edited once more as it is read with the teacher.

The students write their final draft.

[Self-Monitoring]
[Self-Evaluation]

[Deduction/Induction]
[Elaboration]
[Transfer]
[Summarizing]

[Cooperation]
[Questioning for Clarification]

V. FOLLOW UP:

The students divide into their groups and are given a time line in black felt.

Each student fills in his/her date (month, year) using a red felt pen, in sequential order. The students write their paragraph summaries under their chosen dates. The white paper is glued onto half sheets of black construction paper.

The time line is stapled to the bulletin board in sequential order. Once on display each student reads his/her chosen date. They are read in sequential order as they are displayed on the time line.

[Imagery]

Strategy Instruction:

[Summarizing]--

- Is this time clear? (yes)
- Why? (can plainly see the dates and events)
- Is this clearer than the book? (yes)
- How? (only important information)
- How did you get only the important information or ideas? (summary - point form)
- Which would be easier to study? (point form)
- Which is used for display? (paragraphs)
- When you have something to study how would you summarize? (point form)
- Once you have it in point form, what can you do with it? (write sentences)

[Elaboration]--

- Do you think you could have done these paragraphs if we didn't summarize it in point form? (no)
- Why not? (wouldn't know what to write)
- What we did in the last lesson gave us prior knowledge to build upon today. What strategy have you used? (elaboration)
- Did the activities from yesterday transfer to today's lessons? (yes)

[Imagery]--

- Do you understand what a time line is? (yes)
- What helps you to understand? (worksheets, bulletin board display)
- What do you see when you look at the bulletin board? (picture of a time line)
- What does this picture or image of a time line do for you? (helps us remember and understand the dates and events)
- What strategy is this? (Imagery)
- In what subject could you make time lines? (history)
- As you read about events in history, what could you write down to help you as you read? (dates)
- Would this help you? (yes)
- How? (remember)

The Space Race

Learning Log - Lessons 11 & 12

Note: This follows the Learning Log format in Chamot & O'Malley (1992), *Building Bridges* (see Chapter 2).

VOCABULARY:

Nouns

___ American
___ astronaut
___ cosmonaut
___ layer
___ moon rover
___ ozone
___ race
___ Russia
___ skylab
___ spacecraft
___ space shuttle
___ U.S.A.
___ U.S.S.R.

Adjective

___ manned

Verbs

___ circle
___ prove
___ spacewalk
___ survive

CONTENT:

I can:

_______ Understand the history of the space program.
_______ Explain the Discovery's relation to other space shuttles.
_______ Use sequential order on a time line.
_______ Explain how new missions are built upon the discoveries of previous missions.

LANGUAGE:

I can:

_______ Summarize information in point form using "wh" questions.
_______ Write a paragraph from point form.

LEARNING STRATEGIES:

I can:

_______ Use many resources to gather information.
_______ Group words according to their classifications.
_______ Note take using "wh" questions.
_______ Summarize in paragraph form.

Chapter 5

Intermediate Unit: Animals and their Habitats

Chapter 5

Intermediate Unit: Animals and Their Habitats

Introduction

This unit was first used with a group of ESL students in grades 3-6 who were functioning at an intermediate level of language proficiency.

The main goal or objective of this unit was to teach the students how to do research projects, make oral presentations, and write summaries. These are skills which are absolutely essential within their regular classrooms.

Animals were chosen as a theme because young students normally have a great interest in animals, and the topic correlates with the various regular curricula integrating animals with their habitats in science and geography.

Mathematics was not integrated into this unit because the research component constituted a heavy enough topic as it was. However, math word problems could easily be integrated into a lesson on one of the habitats.

Another reason for choosing this theme was that it allowed a very smooth progression from an ESL text to atlases and other books in the library. *Open Sesame: Prairie Dawn's Purple Book* was followed very closely in developing the lessons for this thematic unit, though the content was manipulated quite extensively to suit the Foresee goals described in previous chapters. We must emphasize, however, that this unit could easily be done using other materials; this particular book is certainly not essential.

Summary of Lessons: Animals and Their Habitats

1. Introductory lesson
    - From words to sentences
2. Poetry
    - From note taking to sentences
3. Prose
    - From note taking to sentences
4. Geography
    - Identifying habitats on a map
    - Using an atlas
5. Research
    - Finding information about one animal

6. Presentations
    - Oral presentations of research findings
    - Making summaries

Note: The particular habitat emphasized in this unit is the **forest**. The teacher can follow the procedures in lessons 1-6 for other habitats, e.g., **desert, ocean**, and **jungle**.

7. Webbing
    - Creative writing: story composition

8. Chart
    - Summarizing

Lesson 1: Animals and Vegetation

Objectives:

Content Objectives:

To learn the names of forest animals and vegetation.

Language Objectives:

Skills:

- Listening - for information and instructions
- Speaking - to share and verify answers
- Reading - for names
- Writing - declarative sentences

Linguistic Knowledge:

Vocabulary development:

- Animals - deer, porcupine, eagle, squirrel, chipmunk, raccoon, fox, bear, rabbits, robin, crow, frog, mouse
- Vegetation - trees, pinetrees, bushes, ferns, mushrooms, branch, trunk, leaves, needles, lily pads, stump
- Other - stream, bank, hole, nest, nut, quill, fur

Structures:

- Subject-verb agreement
- Articles
- Capitalization - Punctuation
- Singular/plural forms
- Prepositions, prepositional phrases, objects of prepositions

Functions:

- Classifying
- Naming

Learning Strategies:

Metacognitive Strategies:

- Selective attention
- Organizational planning
- Self monitoring
- Self evaluation

Cognitive Strategies:

- Imagery
- Inferencing
- Resourcing
- Deduction/Induction
- Transfer
- Elaboration

Social-Affective Strategies:

- Cooperation
- Asking questions for clarification

Materials:

- Pictures of forest animals, e.g., cards with the names on the back or books with pictures and the names of the animals.
- A picture of animals in a forest scene, e.g. *Open Sesame: Prairie Dawn's Purple Book*, p. 26.

Procedures

I. PREPARATION:

A. Distribute pictures of a forest. Ask:

- What is this a picture of? (a forest)
- How do you know?
- Count and number all the animals in the picture of the forest.
- How many animals are there?
- Can you name them?

[Inferencing]

B. Distribute the picture cards of animals or the books with animal pictures. Tell the students they have three minutes to write the name of each animal on a piece of yellow sticker paper and stick it beside the picture. They work in groups.

C. After three minutes ask the students to give you the names of each animal. Write them on the board as they name them. Ask them how to spell the names.

D. Repeat the same procedure with the other vocabulary items (e.g.,vegetation) that the students should learn.

[Selective attention]
[Self-monitoring]
[Self-evaluation]

[Imagery]
[Resourcing]

[Cooperation]
[Questioning for Clarification]

Strategy Instruction:

[Imagery]--

Ask:

- Did the pictures of the animals help you identify the animal? *[imagery]*
- Do pictures or images make it easier to remember?
- Why?
- Let's look on the green sheet. Which strategy did you use to help you to understand?

- Did working together or cooperating help you learn?
- What did you do to cooperate?

[Cooperation]
[Questioning for Clarification]

II. PRESENTATION:

The students have all the words or vocabulary relating to the animals and vegetation. They will progress from pictures to words to sentences, integrating:

- Subject, verb, preposition, object
- Articles
- Prepositions
- Singular/plural forms
- Subject - verb agreement
- Capitalization
- Punctuation

Depending upon the level of language proficiency of the students, the model could be given if needed. The model has been provided for some of the class when required.

[Deduction/Induction]--

Ask:

- What can we do with all these names?
- Where are the animals?
- Where is the deer?
- Where is the raccoon? etc.
- Ask where each animal is.
- Write the word (preposition) that each student contributes. You will then have a list of prepositions.

Ask:

- What question do all these words you have given me answer? (WHERE) Write WHERE above the words.
- What are words that answer WHERE called? (prepositions)

[Organizational Planning]--

- We are going to write sentences telling us where each animal is.
- How many animals are there?
- How many sentences will we write?
- How do you think we will write the sentence? Have a student give a model and write it on the board; e.g., The bear is between the trees.

Strategy Instruction:

[Deduction/Induction]--

Ask:

- What will you name first in the sentence? (animal)
- What will be in front of the animal? (the)
- Will you always write "is"?
- What will you write after rabbits? (are)
- Why?
- If there is more than one animal what do you have to remember to put on the end of the animal? "s"
- What will you write next? (where the animal is - preposition)
- Will your sentence look like this?

The	(animal)(s)	is are	on, behind between, beside, in front of under	the (place).
	subject	**verb**	**preposition**	**object of Prep.**

[Transfer]--

- Where will you find the words for your sentence? (from the activity we did when we wrote the names at the beginning of the lesson).

III. **PRACTICE:**

Working in pairs or individually, the students write their sentences.

[Self-Monitoring]

[Deduction/Induction]
[Transfer]
[Elaboration]

IV. **EVALUATION:**

When the sentences are completed they edit and read them to their partner.

[Self-Evaluation]

[Cooperation]
[Asking Questions]

V. **FOLLOW UP:**

They read their sentences to the teacher for final editing.

Lesson 2: Poetry (Language Arts)

Objectives:

Content Objectives:

To compare poetry and prose.

Language Objectives:

Skills:

- Listening - to note take; to distinguish between poetry and prose
- Speaking - to correct and verify answers
- Reading - for answers
- Writing - to complete and correct sentences

Linguistic Knowledge:

Vocabulary Development:

- Senses - touch, smell, see
- Poetry - poems, rhymes, lines, beats, stanzas, space
- Prose - story, sentences, paragraphs, indent

Structures:

- Subject - verb agreement
- Punctuation
- Singular/plural forms
- Present tense
- Declarative sentence form

Discourse Features:

- Theme - rheme structure

Functions:

- Reporting information by writing declarative sentences (derived from questions)
- Summarizing - writing a summary comparing poetry to prose

Learning Strategies:

Metacognitive Strategies:

- Selective attention
- Organizational planning

- Self monitoring
- Self evaluation

Cognitive Strategies:

- Note taking
- Inferencing
- Summarizing
- Elaboration

Social and Affective Strategies:

- Cooperation
- Asking questions for clarification
- Self talk

Materials:

- Forest picture
- Poem about a forest, e.g. "Come to the Forest" - *Open Sesame: Prairie Dawn's Purple Book*, Teacher's Book, p. 26.
- Article (story) about a forest e.g. *Open Sesame: Prairie Dawn's Purple Book*, p. 26.

Procedures:

I. **PREPARATION:**

- Review the forest animals and vegetation.
- Show the students the questions and ask:
    - What are we going to do?
    - How many questions are there?

[Inferencing]

II. **PRESENTATION:**

A. Students silently read a set of questions on the board or transparency. (See the Appendix at the end of this **lesson** for the list of questions.) The teacher reads the questions orally, reviewing any vocabulary the students do not understand.

B. The students number their papers #1 - 7 to prepare for note-taking.

Strategy Instruction:

[Note Taking]--

Ask:

- When you take notes what do you write down? (answers only)

- Do you write complete sentences? (no)
- Who are the notes for? (ourselves)
- How many answers will you write? (7)

[Selective Attention & Organizational Planning]--

- How will you know when you hear an answer?
- What are you going to be listening for?
- What would be the special words you would be listening for in number 1?
- Underline the word they say, in different colored chalk.
- What can you *smell* in the forest?
- When you hear the word "smell," what will you hear after that special word? (the answer).
- Do the same procedure with the other questions, underlining the key words they will be listening for.
- Will listening or paying attention to these key words help you note take?
- If you did not take notes would you remember?
- What does note taking do for you?
- Remember the notes are for you, not for me, so spelling is not important at this point. Remember to just write one or two words, not sentences.

C. The students close their books and the teacher reads the poem fairly slowly. The students listen and write the answers (as they hear them) by the appropriate number.

Strategy Instruction:

[Self-Monitoring]--

Ask:

- Did you get all the answers?
- How many did you get?
- Do you want me to read it again?
- Which answers will you be listening for?
- What will you be doing when you hear an answer you have? (check it).

D. The teacher reads the poem orally a second and a third time if necessary to ensure that the students have answered most of the questions. Each oral reading increases in speed.

III. **PRACTICE:**

Assign the students to groups or partners. Open books or give the students the written text of the poem. They compare and check their answers against the written text for:

- Correct answers
- Correct spelling

Assign a definite time limit, e.g. 5 minutes.

[Self-Evaluation]

[Cooperation]
[Asking questions]

IV. EVALUATION:

Strategy Instruction:

[Cooperation and Asking Questions]--

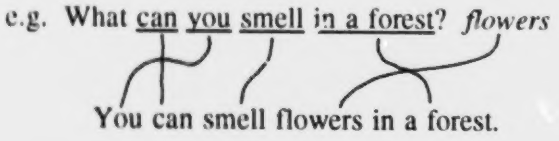
Ask:

- How did you do?
- Did you and your partner have the same answers?
- Was it easier to check when you worked with a partner?
- Why?
- When you cooperated with your partner and asked questions, did it help you learn?
- What strategies on the pink sheet did you use?

[Self-Evaluation]--

Close books and the students give the teacher the correct answers orally. The teacher writes the correct reply on the board beside the question, in a different colored chalk.

The students write complete and correct sentences, underlining and using the words in the questions and the answers on the board.



e.g. What can you smell in a forest? *flowers*

You can smell flowers in a forest.

They do not have the written text in front of them. When finished, they edit their work with their partner and present it to the teacher.

V. FOLLOW UP:

Comparing poetry to prose, using a story and the poem from this lesson.

Ask:

- Is this a story or a poem? (poem)
- How do you know? (title)
- How is a poem different from a story? (rhymes)
- Circle all the rhyming words.
- Review them.
- Does a story rhyme? (no)

- Who writes a story? (an author)
- Who writes a poem? (a poet)

Display the poem and the article on the forest and ask:

[Elaboration] (using the prior knowledge of
the poem to compare poetry to prose)--

- How else is a poem different from a story? (lines)
- What does a story have? (sentences)
- What is it called when all the sentences are grouped together like this in a story? (paragraph)
- Are the lines in a poem groped together? (yes)
- What do you call them? (stanzas)
- How can you tell when there is a new paragraph in a story? (space or indent)
- How can you tell when there is a new stanza in a poem? (space)
- How many stanzas are there in this poem? (2)
- What is the first stanza about? (senses - smell, touch, see)
- What is the second stanza about? (animals)
- When you read a poem, do you read it like a story? (no)
- How do you read it?
- What do you hear? (beats)
- Clap the beats in the first line as you read it to yourself.

[Self-Talk]

- How many beats?
- Let's clap the beats together as we read it? When do you clap? (important word)
- When you study poems, what is it called? (poetry)
- When you study stories what is it called (prose)

Let's write a SUMMARY.

- When you summarize what do we write down? (important ideas)

Write: poem --> poetry story --> prose

Write everything you remember about poetry under "poetry," and everything you remember about prose under "prose."

(continued next page. . . .)

POETRY	PROSE
- poem	- story
- written by a poet	- written by an author
- rhymes	- doesn't rhyme
- lines	- sentences
- beats	- no beats
- stanzas - spaces between stanzas	- paragraphs - indent paragraphs - spaces between them, in books

[Summarizing]--

Ask:

- What strategy have you done on the green sheet? (summarizing)
- How does summarizing help you?

Lesson 2 Appendix

Questions for the note taking exercise in the Presentation Phase:
on "Come to the Forest" (Poem)

1. What can you smell in the forest? (flowers)
2. What can you touch in the forest? (trees)
3. What can you see running free? (animals)
4. Where do rabbits live? (in holes in the ground)
5. Who will you see running around? (deer, foxes)
6. Who will you see in a tree? (squirrels, birds)
7. Where is a great place to be? (forest)

Lesson 3: The Forest (Science and Language Arts)

Objectives

Content Objectives:

- To learn about the forest.

Language Objectives:

Skills:

- Listening - to note take
- Speaking - to correct and verify answers
- Reading - for answers
- Writing - to complete declarative sentences

Linguistic Knowledge:

Vocabulary Development:

- forest - cool, dark, wet, thin, shade, ferns, ground

Structures:

- Punctuation (use of commas for listing items)
- Capitalization
- Subject - verb agreement

Discourse Features:

- Theme - rheme structure

Function:

- Answering questions by writing declarative sentences, using the words given in the questions

Learning Strategies:

Metacognitive Strategies:

- Selective Attention
- Organizational Planning
- Self Monitoring
- Self Evaluation

Cognitive Strategies:

- Note taking
- Inferencing

Social Affective Strategies:

- Cooperation
- Asking questions for clarification

Materials:

- An article (story) about a forest, e.g. *Open Sesame: Prairie Dawn's Purple Book*, p. 26.

Procedures:

I. **PREPARATION:**

- Compare poetry to prose, referring to the summary from Lesson 2.
- Show the students the article on page 26 and ask:
    - Is this poetry or prose?
    - What are the differences?
- Look at the questions on the board. Ask, what do you think we are going to do?

II, III, IV. **PRESENTATION, PRACTICE AND EVALUATION**

Follow the same steps as in Lesson 2. The questions for this activity can be found in the Appendix to this **lesson**.

- Books remain closed throughout presentation as they are note taking.
- Books remain open during the practice phase as they are checking their answers.
- Books remain closed during the evaluation phase when they are giving the teacher the correct answer.

FOLLOW UP:

- Books remain closed.
- Students write the answers in complete sentences using the words in the questions and the answers.

[Selective Attention]--

Ask:

- What words in the question will you use in your answer? (underline them).

What is the forest like? cool, dark, wet
How will you write that in a sentence?

The forest is cool, dark, and wet.

[Deduction/Induction]--

- What do you have to remember to begin every sentence with? (a capital letter)
- What is at the end of every sentence? (a period)
- When you are listing three things like this, what do you put between them to separate them? (commas)
- What do you put before the last word when listing things? (and)

When the sentences are completed, they read them and edit their work with a partner. The final draft is read to the teacher and, if necessary, edited with the teacher.

Lesson 3 Appendix

Questions for Presentation Phase - Forest (Prose)

1. What is the forest like? (cool, dark, wet)
2. What kind of leaves do plants have? (thin leaves)
3. What do trees provide? (shade)
4. Where do ferns grow? (along the ground)
5. Who lives in the forest? (the animals)
6. Where do the animals live? (underground, on the ground, in trees)

Lesson 4: Forest Geography

Objectives:

Content Objectives:

- Using the atlas as a resource to find information.
- Map activity: to provide visual representation of forests of the world.

Language Objectives:

Skills:

- Listening - for information
- Speaking - to answer questions
- Reading - an atlas for specific information
- Writing - on a map

Linguistic Knowledge:

Vocabulary Development:

- Vegetation - pine trees
- Continents - North America, South America, Europe, Asia, Australia, Africa, Antarctica
- Equator - northern hemisphere, southern hemisphere, 0 degrees
- Prime Meridian - Eastern hemisphere, Western hemisphere

Structures:

- Common and proper nouns
- Capitalization

Function:

- Labeling - the title; continents, equator and forests of the world

Learning Strategies:

Metacognitive Strategies:

- Organizational planning
- Self-monitoring
- Self-evaluation

Cognitive

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- Resourcing

- Imagery
- Transfer
- Elaboration

Social - Affective Strategies:

- Cooperation
- Asking questions

Materials:

- An atlas.

Procedures:

I. PREPARATION:

- Discuss which animals and vegetation are in a forest. Draw attention to the pine trees. Ask: (Brainstorm)
    - Where are the forests in the world?
    - Have you ever seen pine trees in Canada?
    - Where?
    - Were there pine trees in your country?
    - What could we use to see where the forests are in the world? (an atlas).
    - Is the atlas a reference material or a resource?
    - Why?
    - Let's get the atlases and look for the forests.

[Resourcing]

II. PRESENTATION

Review geography from another unit:

- On which pages will we find Vegetation of the World?
- Let's review the continents.
- How many are there?
- Can you name them?
- What line divides the world into north and south? (Equator)
- What does the equator divide the world into? (halves)
- What are these halves called? (hemispheres)
- What does hemisphere mean? (half circle)
- What is the northern part of the world called? (northern hemisphere)
- Where is the northern hemisphere? (above the equator)
- What is the southern part of the world called? (southern hemisphere)
- Where is the southern hemisphere? (below the equator)
- What line divides the world into east and west? (Prime Meridian)
- What is the western part of the world called? (western hemisphere)

- What is the eastern part of the world called? (eastern hemisphere)
- Can you find the picture of the forest?
- What color will we look for on the map? (light green)
- In which continents are the major or largest forests? (North America, Europe, Asia)
- What hemisphere are these continents in? (northern)
- Are they close to the equator or far from the equator? (far)
- Do you think these forests get snow?
- Do you think being far from the equator has something to do with that? Why?

[Planning]
[Resourcing]
[Imagery]

Strategy Instruction:

- Does looking at the map help you to understand where the forests are?
- What strategy is that on your green sheet?
- Do images or pictures help you remember?
- Is the atlas a good resource for providing a picture of the world?

III. PRACTICE:

Give each student a map of the world. Ask:

- What do you think we are going to do with this map? (draw forests)
- What should be the title of our map? (Forests of the World)
- Here is what we are going to do:
    1. Print all the continents. Why do we print?
    2. Print Equator.
    3. Shade in the areas on the map which have forests.

[Self-Monitoring]
[Transfer]
[Elaboration]

IV. EVALUATION:

- When they have completed their maps, they compare them with their partners'.

[Cooperation]
[Asking Questions]

V. FOLLOW UP

- They show their maps to the teacher and read to him/her.

Lesson 5: Forest Animals Research (Science, Language Arts)

Objectives:

Content Objectives:

- To learn how to use the library to find resources for a research project.
- To do research and to write a report from an outline.
- To learn information about an animal in order to make a presentation at a later date.

Language Objectives:

Skills:

- Listening - for information and instructions
- Speaking - to give information
- Reading - to find information for their research
- Writing - a research report

Linguistic Knowledge:

Vocabulary Development:

- Description; fur, bushy, tail, paws, claws, herbivore, carnivore, omnivore, nocturnal, hibernate, predator, prey, enemies, etc.; prior, prior knowledge

Structures:

- Declarative sentence structure

Discourse Features:

- Rhetorical organization of a descriptive report
- Paragraph formation

Function:

- Describing

Learning Strategies:

Metacognitive Strategies:

- Advance Organization
- Organizational Planning
- Selective Attention
- Self-Monitoring
- Self-Evaluating

Cognitive Strategies:

- Resourcing
- Note taking
- Summarizing
- Elaboration
- Inferencing
- Imagery

Social-Affective Strategies:

- Cooperation
- Asking questions for clarification

Materials:

- Books from the library.

Procedures:

I. **PREPARATION:**

- Students choose a forest animal they would like to research. The class goes to the library, where students look in the card catalogue for books about:
  - their animals
  - forest animals
- The students sign the books out to prepare for note taking in their research.

NOTE: As this is their first research lesson, all the necessary information should be on one page of the book to make it easier for the students to complete. Once the students are more familiar with research, a more difficult book or books may be used.

[Advance Organization] *[Resourcing]* *[Imagery]* *[Cooperation]*

Strategy Instruction:

[Resourcing]--

Ask:

- What kinds of books are you going to use? (library, reference, encyclopedias, etc.).
- How will these books help you? (extra information)
- When you want extra information, do you think you will find it in the library? (yes)
- What does the library have? (books, dictionaries, encyclopedias, filmstrips, etc. OR lots of resources).
- This is a strategy called RESOURCING. These extra resources give you the extra information you need to complete a task.

- Resourcing is not on any of the sheets but it is an important strategy to help you understand and remember information.
- What sheet should we add RESOURCING to? (green)
- What can we use to describe RESOURCING on the green sheet? (write a class definition).

[Imagery]--

Ask:

- When you were looking for your library books, which books attracted you? (lots of pictures)
- Why? (easier to understand)
- What strategy is that on the green sheet?
- How do pictures help you to understand or remember?

II. PRESENTATION

In the classroom, the teacher reviews the outline the students will use and explains what it means. (adapted from questions in *Open Sesame: Prairie Dawn's Purple Book*, Teacher's Book, page 26).

The ____________________ .

If I could be any animal in the forest, I would be a (animal) ______ because (why you chose it) ______________________________

I am (description - what you look like) ______________________________

I live (where you live) ______________________________

I eat (foods --> herbivore, carnivore or omnivore) ______________

My favorite thing to do is ______________________________ .

(animals) ______________ are my enemies.

Other interesting things about me are ______________________________ .

The teacher chooses a forest animal and models the activity of completing the outline on the overhead with the class. The students assist by finding the necessary information in the book and tell the teacher what to write. The teacher completes the outline and models the complete task with the class.

[Organizational Planning]
[Selective Attention]
[Self-Monitoring]
[Note taking]
[Resourcing]
[Summarizing]
[Elaboration]
[Cooperation]
[Questioning for Clarification]

Strategy Instruction:

Ask:

- What strategies did you do on the green sheet?

[Note Taking] (from a written text)--

- What do you write down as you take notes? (important words)
- When do you take notes? (while reading)
- Is this different from taking notes during a listening activity? (yes)
- How is it different? (have to read it)
- How does taking notes help you? (remember it)
- Have you ever read something, not taken notes and tried to find it later?
- Besides helping you to remember, does taking notes save you time?
- Does taking notes as you read help you understand the material or information better?
- How?

[Summarizing]--

- When you were note taking on the outline, what were you filling in? (important ideas)
- What other strategy is this? (summarizing)
- Once we completed the outline, which was a summary, which was easier to understand, the book with the information or the summary?
- Why?
- Could you do this with other information as you are reading?

Tell the students to turn to their green sheet.

[Inferencing]--

- When you were filling in the missing parts of the outline, were you guessing what goes where?
- What strategy is it when you guess where to write something to fill in the missing parts? (inferencing)

[Resourcing, Elaboration]--

- When you use library books or other reference materials, what strategies are you using? (resourcing)
- Do you understand why we added this strategy to the green sheet?
- How does resourcing help you?
- What do these books or resources give you? (extra information)

- Does this help you to learn new things or ELABORATE upon what you already know?
- What is this strategy called? (elaboration)
- What helps you to understand the new information? (what I already know)
- In other words, could you say you start here and it goes like this? (gesturing - spreading arms apart)
- Think about what you knew about animals when we started this unit and think about what you know now. Have we built upon your prior knowledge, that is, what you already know? (yes)

III. PRACTICE:

The students will follow the teacher's model by reading their books and writing the information as they find it. Although each student has chosen his/her own animal, students work together to assist each other in finding the necessary information.

The teacher circulates around the room giving students the cues or assistance they need to move ahead.

[Organizational Planning]
[Selective Attention]
[Self-Monitoring]

[Note Taking]
[Resourcing]
[Summarizing]
[Elaboration]
[Inferencing]

[Cooperation]
[Questioning for Clarification]

Strategy Instruction:

After this phase has been completed tell the students to turn to the blue sheet and ask:

[Organizational Planning]--

- How did you plan what to do?
- Did our outline help you to plan how to complete your outline?
- How?
- Does planning how to attack the material help you learn?

[Selective Attention]--

- Did you have to pay special or selective attention to key words which helped you to complete the task?
- How did looking for those key words help you?
- If you were looking for food your animal eats, what key word did you look for?
- Did that give you the answer?
- When you have other assignments, do you think it would help you learn if you paid attention to the key words in the questions before starting to read?

[Self-Monitoring]--

- Were you checking your work as you were doing it?

- What strategy is that?
- When do you self monitor? (as we are working)

IV. EVALUATION:

When the students have completed the first draft of their outlines, they edit them with partners before presenting them to the teacher. As each student reads theirs to the teacher, the outline is edited for the final draft.

[Self-Evaluation]

[Cooperation]
[Questioning for Clarification]

Strategy Instruction:

[Self-Evaluation]--

- How did you do?
- Is it complete?
- Did you edit it?

V. FOLLOW UP:

The students choose a picture of their animal, which is made into a transparency. The transparency is enlarged on the overhead. Each student chooses a piece of large colored construction paper (the color of the animal) and using the overhead, draws the animal on the construction paper. Students outline their animals in black felt and write their final drafts on the animal's body.

Once their animals are completed they practise reading and presenting their work in preparation for presentations to the class at a later date.

After the presentations to the class, these animals are displayed on the bulletin board. The title of the bulletin board is "Habitats". Each habitat will be displayed so the students will instantly remember where each animal lives - prior knowledge.

HABITATS

FOREST	DESERT	OCEAN	JUNGLE
Animals mounted on green paper	Animals mounted on brown paper	Animals mounted on blue paper	Animals mounted on green paper

Lesson 6: Forest Animals Presentations (Science, Language Arts)

Objectives:

Content Objectives:

- To learn how to present a project to the class.
- To learn about other animals that live in the forest.

Language Objectives:

Skills:

- Listening - for information
- Speaking - to present a project
- Reading, writing - a summary, note taking

Linguistic Knowledge:

Vocabulary Development:

- All the academic vocabulary associated with the presentations

Structures:

- Punctuation: commas

Function:

- Summarizing

Learning Strategies:

Metacognitive Strategies:

- Organizational planning - done before when going over the outline
- Selective attention - when listening to the presentations
- Self monitoring - during presentations
- Self evaluation - at the end of the presentation and when compared with a partner or group

Cognitive Strategies:

- Note taking
- Summarizing
- Grouping
- Elaboration
- Auditory representation - (not on sheets)
- Transfer - (not on sheets)

Social-Affective Strategies:

- Questioning for clarification
- Cooperation

Procedures

I. **PREPARATION:**

The students are aware of the order of the presentations, and have practised reading their projects during a previous lesson and at home.

The students are given an outline of the summary and review it with the teacher. The outline of the summary follows the same order as the outline for their research project.

The ______________________________.

Description ____

____

Habitat ____

____

Food ____

____

Enemies ____

____

Other ____

____

[Selective attention]
[Organizational Planning]
[Advance Organization]
[Note Taking]
[Summarizing]
[Grouping]

Let's look at your green sheet.

[Note Taking]--

Ask:

- Why were you given this outline? (to fill in)
- When? (during the presentation)
- What strategy will you be doing on the green sheet? (note taking)

[Summarizing]--

- As you are note taking, what will you be filling in? (information)
- What kind of information? (important ideas)
- When you have taken notes of just the important ideas, what other strategy have you done on the green sheet? (summarizing)
- How many animals do we have to present today? (2)
- How many animals do we have to present altogether? (8)
- How many summaries will you have altogether? (8)

Then you will know about all the animals in the forest, and not just yours.

[Grouping]--

- When you are writing your outline, where would you write "herbivore"? (under food)
- Why? (It belongs there)
- How do you know? (It tells what it eats)
- What strategy on the green sheet would this be? (grouping)

[Selective Attention]--

- When you are listening for specific information or key words during the presentations, what words will you be listening for under:
  - description? (I am or I have)
  - habitat? (I live)
  - food? (I eat)
  - enemies? (My enemies)
  - other? (Other interesting)

- Do you think this is a strategy?
- Does it help you plan your learning?
- What sheet should we add this strategy to?

We can add it to the blue sheet. It is "Selective Attention" which means we listen or read for key words. We have used this strategy when we used what other strategies? (note taking, summarizing, grouping, classifying, prediction/inferencing).

[Organizational Planning]--

Let's review the task:

- What are we going to do? (Listen to the presentations and take notes)
- How will the presenter read - quickly or slowly? (slowly)
- Do you think you will get all the information in the first reading or will the presenter have to read it more than once? (more than once)
- When you have most of the information, you will be divided into groups to check your work.

The presenter will correct the answers with you.

- What strategy on the blue sheet are we doing now? (Planning what we will do)
- What does this help you to do? (learn)

II. PRESENTATION:

A designated student stands at the front of the room, shows his/her animal and reads his/her project slowly to the class. As the presenter reads, the students listen and take notes.

[Self-Monitoring]
[Selective Attention]
[Note Taking]
[Summarizing]
[Grouping]
[Cooperation]

Strategy Instruction:

[Self Monitoring]--

- After the first reading, ask the students if they have completed the summary? (No)
- Do they need another reading? (Yes)
- The presenter reads his/her project a second time at a more rapid pace and the students complete their summaries.
- Do you have all the answers yet? (some will say yes and some will say no)
- Let's read it one more time so you can complete the summary or check your answers.
- The presenter reads the project for the last time at a regular rate while the students check and/or complete their summaries.

NB: This procedure gives the presenter a purpose for reading clearly and carefully to the class, instead of rushing through the presentation just to get it over with. This will promote a positive atmosphere and self confidene for the presenter.

Using SELECTIVE ATTENTION during this procedure gives the class a purpose for listening to the presentation instead of "tuning out" or "falling asleep" until it is their designated time to present.

Another advantage to this technique or procedure is that all of the students will have all of the information about all of the animals in the forest rather than just their own.

III, IV. PRACTICE AND EVALUATION:

Assign students to a partner or a group. Set a definite time limit, 5 minutes, for the students to compare and correct their answers with each other. When this task has been completed, the presenter corrects the information with the class following the outline the teacher has written on the board.

The presenter fills in the title. Under the heading description, the presenter asks the class, "What does this animal look like?" The students raise their hands and give the presenter the information. The presenter writes it on the board correctly, checking the spelling with their project. The students check the presenter's information against their own.

Punctuation (e.g. commas) is integrated into this part of the lesson as the presenter is listing the information on the board.

- When you are listing things what do you use? (commas)
- Why? (to separate them)
- What do you use before the last item or thing listed? (and)
- Do you use a comma? (no)

[Deduction/Induction]

V. FOLLOW UP:

Strategy Instruction:

Let's look at the blue sheet:

[Planning]--

- What strategies did you use to learn more? (planning)
- When did you plan? (during the preparation, when we were preparing for note taking and going over the outline of the summary)

[Selective Attention]--

- What other strategy? (selective attention)
- When did you use selective attention? (before the presentations, when we were discussing what words to listen for in the presentations)
- Do you understand why we added it to the blue sheet?

[Monitoring]--

- What other strategy? (monitoring)
- When? (during the presentation we were listening and taking notes. We could monitor how we were doing)
- How did you do?
- Did you get all the information from the first reading? (no) Second reading? Third reading?

[Evaluation]--

- What other strategy did you do? (evaluation)
- When? (after we finished listening and while we were correcting)
- Did I evaluate you or did you evaluate yourself? (we did)
- How did you do?
- Was most of your information correct?

How did these metacognitive strategies on the blue sheet help you learn more? (We know about all the other animals in the forest besides our own.)

Let's look at the green sheet:

[Take Notes] --

- What strategies did you use on the green sheet to help you understand and remember? (take notes)
- When did you take notes? (duing the presentation)
- How did that help you? (helped us remember the information)
- What did you write down? (important ideas)

[Summarizing]--

- What other strategy did you do as you were note taking? (summarizing)
- When did you summarize? (as we listened for importan' ideas or key words to fill in the outline)
- What is the outline? (a summary)
- What was the summary similar to? (the outline used during the research.)
- Do you think I did that on purpose? (yes)
- Which is easier to understand, the paragraph about the animal or the summary? (summary)
- Why? (point form, important ideas)

[Grouping]--

- What other strategy did you do when you were note taking? (grouping)
- How did you group? (When we heard a word we had to know where to put it in the summary -- under which heading or category.)
- Do you think doing your own project helped you to recognize where to group the word during the presentation? (yes)
- When you group words together is it easier to understand and remember?
- Could you do this with other work? (yes)
- When?

[Elaboration]--

There is another strategy on the green sheet that you did. Do you know what it is? (Elaboration) If they cannot identify it, tell them.

- How did you do this?
- What did you know yesterday?
- What did you learn today?
- If you had not researched an animal yourself, would you understand the presentation today or would it have been difficult?

Other cognitive strategies - not on the green sheet. Discussion is optional depending upon your students and their knowledge of the strategies.

[Auditory Representation]--

- When? (during note taking)
- How? (as they were recalling words to write down)

[Transfer]--

- When?
    - using previous vocabulary summary of other new information.
    - using note taking.
- How did all of these cognitive strategies on the green sheet help you?
- Do you understand the information that was presented? (yes)
- If I asked you a question about the (animal) could you answer it? (yes)
- Why? (because we have the information in the summary)
- Turn your papers over. Is the _________ a herbivore, omnivore or carnivore?
- Where does it live?
- Who are its enemies?
- How did you remember this? (strategies and the activity)

Let's look at the pink sheet:

- What strategies did you use on the pink sheet to help yourself and others to learn?

[Cooperation]--

- When? (during the presentation when the presenter read slowly so we could take notes)
- When else? (when we were comparing and correcting our outlines after the presentation)
- When else? (when correcting the outline with the presenter)
- How? (gave the presenter the information to fill in the summary)

[Asking Questions]--

- What other strategies did you use on the pink sheet? (asking questions)
- When? (when we were comparing and correcting with our partner or group)
- When else? (during the correction with the presenter)
- Were most of your answers correct? (yes)

[Self Talk]--

- When you the presenter were writing information on the board, what did you do as you were writing? (say the words and spelling to themselves)
- Did that help you to write it down?
- How?
- When you were taking notes did you say the words to yourself as you were writing them down?
- What strategy on the pink sheet is that?
- When you use self talk, how does that make you feel?

- Great! Do you think these strategies help you to learn, understand and remember?
- Please read your summaries to me before you leave.

Note to the Reader:

The study of only one habitat -- the forest -- has been completed at this point. There are still three other habitats to complete -- the desert, the ocean and the jungle.

Follow the same general procedures in lessons 1, 3, 4, 5 and 6. The only lesson you may choose to omit is lesson 2 on poetry. When you are studying the jungle (the last habitat), change the research outline, in Lesson 5, to questions (see below) and provide assistance as the students move through their Zone of Proximal Development (Vygotsky). This is the next step and is more complex for the students. If some students have not developed their level of language proficiency well enough to move ahead to the questions, then provide them with the usual outline. They will all still have an excellent project.

Don't worry about the time factor. It will be time well spent developing the language and strategies through the content, producing students who are becoming independent learners. Doing all four habitats allows the students the time to progress from an interpsychological plane (Vygotsky - thinking, reasoning and problem solving involving several participants) to a higher intrapsychological plane (internalized and integrated). The teacher is providing a scaffolding effect by assisting the performance of the students from their actual development through their potential development to a higher level of competence (Tharp & Gallimore, 1988). Time is required for this process to occur.

As the students move through their Zone of Proximal Development to a more advanced level of cognitive functioning, they will require less time to complete the tasks, and the activities will progress more rapidly.

Research Questions (Adapted from *Open Sesame: Stage D, Prairie Dawn's Purple Book*)

1. A. If you could be any animal in the jungle, which one would you be?

   ____

   B. Why? ____

   ____

2. What does this animal look like? ______________________________________

   ____

3. Where does this animal live? ____

   ____

4. What does this animal eat? ____

   ____

5. What is this animal's favorite thing to do? ________________________________

   ____

6. Who are this animal's enemies? ____________________________________

____

7. What other interesting things are there to know about this animal?

____

____

____

____

Lesson 7: Webbing and Creative Writing (Language Arts)

Objectives:

Content Objectives:

- To combine all of students' prior knowledge about animals and habitats to write a web and a story.

Language Objectives:

Skills:

- Listening - for instructions and information
- Speaking - to give information
- Reading - for information
- Writing - a web and a story

Linguistic Knowledge:

Vocabulary Development:

- Webbing, main ideas, headings, subheadings, details, indent, paragraphs

Structures:

- Past tense
- Sentence structure
- Capitalization
- Punctuation
- Sentence combining
- Conjunctions

Discourse Features:

- Paragraph structure

Functions:

- Narrating - writing a story

Learning Strategies:

Metacognitive Strategies:

- Advance Organization
- Organizational Planning
- Self-Monitoring
- Self-Evaluation

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Cognitive Strategies:

- Transfer
- Elaboration
- Inferencing
- Grouping
- Summarizing

Social-Affective Strategies:

- Cooperation
- Asking questions

Materials:

- *Open Sesame: Prairie Dawn's Purple Book*, p. 30 and 31 (not required).
- Color-coded web worksheet.

Procedures:

I. PREPARATION:

At this stage, the students have completed research of an animal in each habitat (forest, desert, ocean, and jungle).

If you have *Open Sesame: Prairie Dawn's Purple Book*, instruct the students to read pages 30 and 31 and discuss. It is an interview based on a story about an animal (chimpanzee) who escaped from the zoo. The animal went to all the different habitats and gave reasons why it could not live there until it found its habitat. This lesson is based on that interview. However, you could do the lesson without the story by setting up the scenario with your students.

Tell them they are going to write a story about one of the animals they have done a research project on. This animal has escaped from the zoo and is trying to find its home or habitat. It goes to three different habitats and finds its home in the last one. They will have to give three reasons why this animal could not live in the first two habitats and three reasons why it was suited to live in the last habitat.

Ask:

- Think about the animals you have researched. Which one do you want to write about?

II. PRESENTATION

Ask:

- How will you write your story?
- What do you have to write to help you plan your story? (web)

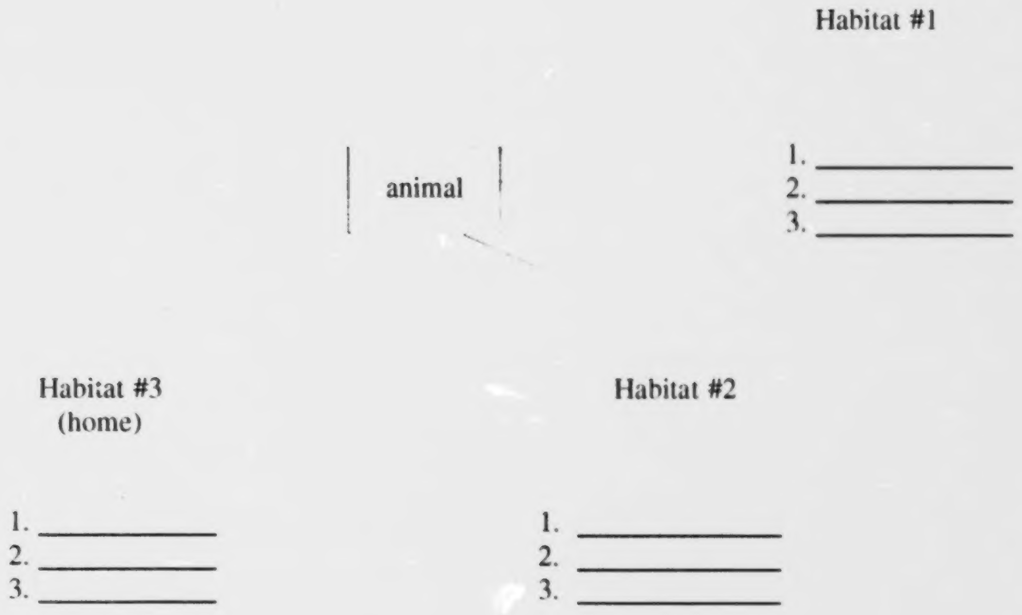
- How do you write a web?
- Model the activity choosing one of the animals. Use a color-coded web (developed by Pat Dalman).
- The main idea is in a red box, subheadings are in green circles, and the details are on blue lines. (See diagram)

Ask:

- What will be the first thing we write in the web? (the title)
- What is the story about? (the raccoon)
- Who is escaping? (raccoon)
- Where would you put the raccoon or the animal? (in the red box)
- Which habitat should we have the animal go to first?
- Where will I write jungle?
- Why would I write it in the green circle?
- What are the green circles? (subheadings)
- Why couldn't a raccoon live in the jungle? Give three reasons.
- Where would I write the 3 reasons? (on the blue lines)
- What are these three reasons called? (details)

Continue to do this with the other two subheadings.

Web model:



Example:

Jungle

- too much rain
- too hot
- no friends

raccoon

Forest

- lots of food
- home
- temperature is just right

Desert

- no food to eat
- no water to drink
- too many enemies

Strategy Instruction:

[Advance Organization] (not on the blue sheet)--
[Organizational Planning]--

Ask:

- Will this web help you to organize your ideas?
- How?
- What have we organized in this web? (heading, subheadings and details).
- Will this web make it eaiser to write your story?
- What strategy is this on the blue sheet? (planning)

[Transfer and Elaboration] -- Turn to the green sheet:

- What do you need to know to complete your web?
- Do you know all the information needed to fill the web in?
- How do you know all this information? (researched the animals)
- Does this make it easier for you?
- What strategies are you using when you are using your prior knowledge? (elaboration)
- What are you doing with this prior knowledge? (transferring it to the new task)

[Inferencing, Grouping & Summarizing]--

- When you are filling in the missing parts of the web, what strategy are you using? (inferencing)
- How do you know what to write and where to write it in the web?
- Do the subheadings help you to decide where to write the details?

- What strategy are you doing when you put the details under the appropriate subheadings? (grouping)
- Once the web is complete, what will you have? (a summary of the story)
- What strategy is this? (summarizing)
- Do these strategies help you understand how to complete a web and write your story?

III. PRACTICE:

- Each student chooses an animal and completes a web. When the webs are complete they show them to the teacher and discuss them.

[Self-Monitoring] *[Cooperation]*
[Self-Evaluation] *[Asking Questions]*

IV. EVALUATION:

Strategy Instruction:

- When all the webs are completed, demonstrate or model (using your web) how to write a story from the web.

[Organizational Planning]-- *[Deduction/Induction]--*

Ask:

- What is the title?
- Where is the title? (red box)
- How do you write a title? (capital letters)
- Where do you write the title? (top of the page)
- What do you write next? (the first habitat)
- Is this your first paragraph?
- How many paragraphs will there be in your story? (3)
- How do you know? (three subheading green circles)
- What do you have to remember to do with each paragraph? (indent)
- How do you indent? (leave a space)
- Let's look at our first paragraph.
- How many details do you have?
- How many sentences will you have?
- Do you think you could combine some of the sentences?
- How?
- It says too much rain and too hot. How would you combine those details into one sentence?
- What word did you use to join those details? (and)
- What are little words which join sentences called? (conjunctions)
- Can you name other conjunctions?
- Could you join any other details into one sentence?

Model how to write the paragraph using your web. Then tell the students to write their stories using their webs.

V. FOLLOW UP:

When they have completed their stories, they edit them with a partner. The students edit as they read the final drafts to the teacher. At a later date they present their stories to the class.

[Self-Evaluation]

[Cooperation]
[Asking Questions]

Lesson 8: Habitats Chart (Science and Geography)

Objectives:

Content Objectives:

- To summarize all the students' information about habitats in a chart.
- To use a variety of materials or resources.
- To reinforce and elaborate upon their geographical knowledge by using an atlas.

Language Objectives:

Skills:

- Listening - for instructions and information
- Speaking - to give information
- Reading - for information
- Writing - a summary

Linguistic Knowledge:

Vocabulary Development:

- Chart, columns, headings, subheadings, classifications, groupings, description, vegetation, animals, location, dash
- All previous vocabulary about animals

Structures:

- Present tense
- Punctuation, commas
- Point form

Functions:

- Classifying and grouping information to write a summary in point form on a chart
- Describing (forests, etc.)

Learning Strategies:

Metacognitive Strategies:

- Advance Organization
- Organizational Planning
- Selective Attention
- Self-Monitoring
- Self-Evaluating

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Cognitive Strategies:

- Inferencing/predicting
- Resourcing
- Grouping
- Note taking
- Summarizing
- Imagery
- Elaboration
- Transfer

Social-Affective Strategies:

- Cooperation
- Questioning for clarification

Materials:

- Chart to be filled in.
- Atlas
- Summaries from Lesson 6.
- *Open Sesame: Stage D, Prairie Dawn's Purple Book*, Unit 4. (Only needed if you used this book; otherwise, the written texts of the books used).

Procedures

I. PREPARATION:

Strategy Instruction:

The students are given a chart.

[Prediction/Inferencing]--

Ask:
- What do you think we are doing today?
- What is the title of this chart? (Habitats)

[Advance Organization]--

- What does "habitats" mean?
- What headings are there at the top of each column? (Forest, Desert, Ocean, Jungle)
- Do you know about those habitats?
- How? (we studied them).
- Let's look at the subheadings under each heading, what do you see? (description, vegetation, animals, location).
- What does description mean? (What it is like)
- What does "vegetation" mean?

- What is the root word of "vegetation"? (vegetable)
- So what do you think vegetation means? (plants)
- What will you put under animals? (names of the animals)
- What does "location" mean? What is the root word of "location"? (locate)
- What does "locate" mean? (to find)
- What could you use to help you find the location? (an atlas)

[Resourcing]--

- What other resources will you use to complete this summary? (books, summary)

[Selective Attention]--

- What are you going to be paying special attention to as you do this chart? (headings and subheadings)
- What are the headings and subheadings? (key words)
- What strategy are you using to help you learn when you pay attention to key words? (Selective Attention)

II. PRESENTATION:

The teacher models with the class, how to complete a habitat on the chart.

- Let's do the FOREST together on the chart.

Description:

- What is the forest like?
- Will you find that in our summary? (they look -- no)
- Where will you find that information? (in the book, e.g.,Purple book).
- Let's look in the book; what does it say? "The forest is cool, dark and wet." (*Prairie Dawn's Purple Book*, p. 26).
- How would you write that in point form using only the important words? Remember you start point form with a DASH (-)
- What would you put after the dash? (- cool, dark, wet)

[Deduction/Induction]--

- What do you have to put between the words to separate them? (commas)
- Put them in (- cool, dark, wet)

Vegetation:

- What plants are in the forest? (trees, bushes)
- Where could you find that information? (in our scribblers from another lesson).
- Okay. What are the name of the plants? (pine trees, bushes, ferns, trees).

Animals:

- Can you name the animals that live in the forest? (They will name most if not all of them).
- Where did you find that information? (picture, animals up on the wall, summaries).

Location:

- How will you find the locations of the forests? (use an atlas).
- Get atlases and open to "The World - Vegetation" page.
- I want you to name 2 things: 1) the continents; 2) the hemispheres
- Let's look at the major forests.
- What continents? - North America; Asia; Europe.
- What does each continent start with? (capital letter). Why?
- Write that.
- What hemisphere? (- North western hemisphere; - North eastern hemisphere).
- Where would you put these hemispheres in the chart? (beside the continents).
- Do you notice the largest or major forests are in what hemisphere? (northern)
- Why?
- What is in the southern hemisphere? (jungles)
- Why?

[Selective Attention]
[Organizational Planning]

[Resourcing]
[Transfer]
[Note Taking]
[Grouping]
[Summarizing]
[Elaboration]
[Imagery]

Strategy Instruction:

Take out the blue sheets:

Ask:

[Organizational Planning]--

- What have we just worked on? (chart)
- How will this help you? (demonstrated how to do the chart)
- Have I helped you PLAN how to do your chart?
- What strategy is that on the blue sheet? (Organizational Planning)

[Selective Attention]--

- As we were planning how to do the chart, what were we paying special attention to, to fill in the chart? (key words)
- Did that help us to complete the chart?

- What strategy is that on the blue sheet? (Selective Attention)

Let's look at the green sheet. We did several strategies on this sheet.

- Do you know what they are?

[Note Taking]--

- What did we do as we were completing the chart? (writing down key words)
- When you write down key words as you are reading, what strategy is that on the green sheet? (note taking)

[Inferencing]--

- As you were filling in the missing parts for note taking, what were you doing? (guessing)
- Were they correct gueses? (yes)
- What strategy were you using to complete the missing parts as you were taking notes? (inferencing)

[Grouping]--

- Where did you write pine trees? (under vegetation)
- How did you know to write it there? (belonged there)
- Where did you write North America? (under location)
- How did you know to write it there? (belongs there)
- What strategy is that on the green sheet? (grouping)

[Summarizing]--

- After you grouped the information under the appropriate heading or classification, what did you have? (all the information)
- When you have all the important information in point form like this, what is it called? (a summary)
- What would be easier to study a written text, or a summary?
- What strategy is this? (summarizing)
- Could you summarize other information you study?
- How do you think this would make it easier to study?

[Resourcing and Transfer]--

- When we were working on our chart, what did we use? (atlases, summaries, books, pictures)
- What are these called? (reference materials)
- When you use reference materials, what strategy are you using? (resourcing)
- How does resourcing help you? (get information)
- If you use several resources what do you get? (more information)

[Imagery]--

- When you were filling in the information on animals, what did you use? (summaries, picture, animals on bulletin board)
- When you were filling in the information on vegetation, what did you use? (pictures)
- When you were filling in the information on location, what did you use? (atlas)
- What are these? (pictures, images)
- What strategy is that? (imagery)
- How does using pictures or images help you? (helps us remember)

[Elaboration]--

- Think about what you knew when we started this unit.
- What did we start with? (pictures)
- What did you learn next? (words)
- What did we do with those words? (write sentences)
- What did you do next? (research)
- What did we do with the research? (presentations)
- As you did the presentations what did we write? (summaries)
- After you did the summaries what did we do? (webbing)
- What did you make from the web? (a story)
- What are we doing today? (Chart)
- Let's look at what we have learned and how we built upon what we learned each day.

Write:

pictures

words

sentences

research

presentations

summaries

webbing

stories

chart

- How many different habitats have we studied? (4)
- Did you know all the information and how to do these activities before?

- When we build upon your previous knowledge, what strategy is that? (elaboration)
- Could we have done research the first day? (no)
- Why not?
- Did elaboration help you to the point where you could do research?

III. PRACTICE:

- Assign students to a group with a designated leader. Set a definite time limit, e.g. 10 minutes, for the students to complete DESERT on the chart.

[Selective Attention]
[Self-Monitoring]

[Resourcing]
[Transfer]
[Note Taking]
[Grouping]
[Summarizing]
[Elaboration]
[Inferencing]
[Imagery]

[Cooperation]
[Asking Questions]

IV. EVALUATION:

- At the end of the assigned time correct the desert with the class. They supply the information which is written on the board or overhead.

[Self-Evaluation]--

Ask:

- How did you do?
- Did you get all the information?
- Have you learned how to do this task?

REPEAT the PRACTICE and EVALUATION procedures with the other two habitats - Ocean and Jungle.

[Selective Attention]
[Self-Monitoring]

[Resourcing]
[Transfer]
[Note Taking]
[Grouping]
[Summarizing]
[Elaboration]
[Inferencing]
[Imagery]

[Cooperation]
[Asking Questions]

V. FOLLOW UP: Habitat Guessing Game

A student from one team names a habitat e.g. forest.

The student from the other team must name:

- 1 word to describe the habitat
- 1 animal that lives there
- 1 plant that grows there
- 1 continent with that habitat and which hemispheres contain that continent.

HABITATS

FOREST	DESERT	OCEAN	JUNGLE
Description:	Description:	Description:	Description:
Vegetation:	Vegetation:	Vegetation:	Vegetation:
Animals:	Animals:	Animals:	Animals:
Location:	Location:	Location:	Location:

Appendix

Habitats Learning Log

VOCABULARY I KNOW:

Geographical Regions

___ Africa
___ Antarctic Ocean
___ Arctic Ocean
___ Asia
___ Atlantic Ocean
___ Equator
___ Europe
___ Indian Ocean
___ North America
___ Pacific Ocean
___ Prime Meridian
___ South America

Nouns

___ amphibian
___ continents
___ dam
___ desert
___ dune
___ fish
___ forest
___ fur
___ habitats
___ hemispheres
___ insect
___ jungle
___ lake
___ mammal
___ mesa
___ nest
___ oceans
___ plateau
___ quill
___ rain forest
___ reptile
___ rodent
___ sand
___ schools
___ shell
___ stream
___ stump
___ water

Adjectives

___ bony
___ bushy
___ clever
___ cold
___ cool
___ damp
___ dark
___ deep
___ dense
___ dry
___ eastern
___ enormous
___ front
___ hind
___ hot
___ long
___ northern
___ powerful
___ rocky
___ round
___ salty
___ shady
___ short
___ southern
___ strong
___ tall
___ thick
___ thin
___ western
___ wet

Forest Animals

___ badger
___ bat
___ bear
___ bobcat
___ chipmunk
___ coyote
___ crow
___ deer
___ eagle
___ fox
___ frog
___ hawk
___ lynx
___ mouse/mice
___ opossum
___ owl
___ porcupine
___ rabbit
___ raccoon
___ rat
___ robin
___ skunk
___ squirrel
___ turtle

Desert Animals

___ bobcat
___ cactus wren
___ camel
___ coyote
___ desert tortoise
___ elf owl
___ jackrabbit
___ kangaroo rat
___ kit fox
___ lizard
___ prairie dog
___ rattlesnake
___ roadrunner
___ salamander
___ scorpion

Ocean Animals

___ angelfish
___ butterfly fish
___ crab
___ dog whelk
___ dolphin
___ grunt
___ jellyfish
___ lobster
___ periwinkle
___ puffer fish
___ ray
___ sea anemone
___ sea shell
___ shark
___ snail
___ sponge
___ starfish
___ whale

Jungle Animals

___ anteater
___ butterfly
___ cockatoo
___ elephant
___ giraffe
___ gorilla
___ hippo (hippopotamus)
___ iguana
___ jaguar
___ leopard
___ lion
___ monkey
___ parrot
___ rhinocerous
___ snake
___ tiger
___ zebra

Forest Vegetation

___ acorn
___ branch
___ bush
___ fern
___ leaf/leaves
___ lily pad
___ mushrooms
___ needles
___ pine trees
___ trunk

Desert Vegetation

___ barrel cactus
___ creosote bush
___ desert palm
___ organ pipe cactus
___ prickly pear cactus
___ saguaro
___ thorn

Ocean Vegetation

___ algae
___ coral reef
___ fan coral
___ kelp
___ seaweed

Jungle Vegetation

___ banana tree
___ coconut tree
___ palm tree
___ plants

Foods

___ acorns
___ bark
___ beetles
___ berries
___ creatures
___ flowers
___ grain
___ grasses
___ minnows
___ nuts
___ shrubs
___ twigs

Academic Terms

___ burrow
___ carnivore
___ Celsius
___ chart
___ classify
___ column
___ dash
___ degrees
___ description
___ details
___ enemy
___ groupings
___ habitat
___ heading
___ herbivore
___ hibernate
___ indent
___ line
___ location
___ main ideas
___ nocturnal
___ omnivore
___ paragraph
___ poem
___ poetry
___ predator
___ prey
___ prose
___ rhyme
___ sentence
___ space
___ stanza
___ story
___ subheading
___ vegetation
___ webbing

LANGUAGE:

I can:

___ Write sentences
___ Complete an outline
___ Do research
___ Write a research project
___ Read and present a project
___ Listen to complete a summary
___ Make a web
___ Write a story from a web
___ Fill in a chart in point form

CONTENT:

I can:

___ Identify animals
___ Identify habitats
___ Identify regions

LEARNING STRATEGIES:

I can:

___ Use resources such as reference materials
___ Group information under the proper classification
___ Listen and take notes
___ Read and take notes
___ Write a summary of information
___ Identify things from pictures
___ Use what I know to learn new things
___ Infer or guess what the missing parts are

Chapter 6

Primary Unit: Foods that Grow

Chapter 6

Primary Unit - Foods that Grow

This unit was designed for a primary class at the grade 2 level. Although the learning strategies are written into the lessons and are included in the learning logs, the students are not given the color coded strategy sheets. These students are very young; therefore, the language arts component is emphasized. The learning strategies are integrated into the lessons in order to expose the students to the strategies which will be directly taught the following year, using the color coded strategy sheets. The learning strategies are also discussed and reinforced when the students are evaluating themselves as they complete the learning logs.

The learning logs are at the end of each lesson or at the end of two or three consecutive lessons in this unit. This procedure was followed to accommodate the needs of these young students. One learning log at the end of the unit would be too difficult and overwhelming for them. Placing the learning logs at the end of the individual lessons will reinforce all the objectives of these lessons, including the learning strategies.

Summary of Lessons: Foods that Grow

1. Introductory Lesson
    - "The Little Red Hen".

2. "The Little Red Hen" follow up
    - Sight words used in context

3. The Path of Wheat
    - Sequential order

4. The Bakery
    - Elaborating upon other baked goods made from flour
    - Classifying according to quantity
    - Prices and money

5. Parts of a Plant
    - Classifying vegetables

6. Plant Problems
    - Math word problems
    - Declarative and interrogative sentences

7. Celery Experiment
    - Doing and writing parts of a science experiment - materials, observation, conclusion
    - Past tense

[Note: This unit could be concluded at this point, if so desired.)

8. "Johnny Appleseed"
    - Biography

9. The Path of an Apple Seed
    - Sequencing

10. Bean Experiment
    - Doing and writing a science experiment incorporating materials, method, observation, conclusion
    - Passive voice

11. Food Chart
    - Grouping

Lesson 1: Introductory Lesson - The Little Red Hen (Language Arts)

Objectives:

Content Objectives:

- To learn about plants and how they grow.
- To learn where flour comes from (the path of a seed).

Language Objectives:

Skills:

- Listening - to take notes and for information
- Speaking - to give information, to share and verify answers
- Reading - for specific information
- Writing - to complete declarative sentences

Linguistic Knowledge:

Vocabulary Development:

- Clothing - dress, hat, apron, cap, T-shirt, shirt, sweater, overalls, jeans, workboots
- Baking - bread, loaf, ingredients, flour, milk, butter, utensils, bowl, wooden spoon, rolling pin, loaf pan, stir, knead, dough, bake, slice, eat, jam
- Planting - bag, sack, seeds, plant, hoe, rows, cover, spring, farm, barn, cut, wheat, scythe, summer, sweat, wheelbarrow, mill, heavy
- Animals - chicken, hen, dog, cat, duck

Structures:

- Past tense - regular and irregular
- Capitalization
- Punctuation
- Prepositions

Discourse Feature:

- Sequential order

Functions:

- Writing declarative sentences (derived from questions).

Learning Strategies:

Metacognitive Strategies:

- Advance organization
- Organizational planning
- Selective attention
- Self-monitoring
- Self-evaluation

Cognitive Strategies:

- Note taking
- Imagery
- Inferencing/predicting
- Resourcing
- Deduction/induction
- Auditory representation

Social-Affective Strategies:

- Questioning for clarification
- Cooperation

Materials:

Addison-Wesley ESL, Level B, Student Book, pp. 21-23, or any other version of "The Little Red Hen". **(See the end of this lesson for a copy of this particular version.)**

Procedures:

I. PREPARATION - Brainstorming

1. As usual, the Text Questioning Technique (see Chapter 3) is used to begin this unit. Tell the students to **OPEN** their books to pages 21-23, *(Addison-Wesley ESL, Level B)*. Tell them they have two minutes to look at the title and the pictures to guess or predict what they think the story is about.

[Advance Organization]

[Prediction/Inferencing]
[Imagery]
(using the pictures to make their predictions)

2. After two minutes, tell the students to **CLOSE** their books and to write down, in a few words, what they think the story is about. Spelling and sentence structure are not important at this time.

3. Listen to each student's prediction, writing the key vocabulary items on the chalkboard or overhead, e.g. hen, lady, chicken, duck, cat, dog.

4. Tell the students to **OPEN** their books and discuss the title and the pictures. Ask questions to elicit more vocabulary (i.e., brainstorm). Write this extra vocabulary on the board, to aid the students when they are note-taking during the presentation stage.

e.g. Look at page 21.

- What is another name for hen? (chicken)
- Is the hen a lady or a man? (a lady)
- How do you know? (She is wearing a dress and a hat.)
- What is she wearing to keep her dress clean? (an apron)
- What does she have in her hand? (a bag of seeds)
- What do you think she is going to do with those seeds? (plant them)
- What else does she have in her hand? (a hoe)
- What do you do with a hoe? (make rows to drop the seeds into and cover them up)
- What season is it? (spring)
- Where does the red hen live? (on a farm)
- How do you know? (barn)
- Who else is in the picture on page 21? (A duck, a cat, and a dog)
- What is the duck wearing? (a cap and a t-shirt)
- What is the cat wearing? (a sweater and overalls)
- What is the dog wearing? (a hat, shirt, jeans and workboots)
- Are they going to help the little red hen? (no)
- Why not? (lazy)

Look at page 22.

- What is the red hen doing? (cutting the wheat)
- Where did the wheat come from? (the seeds)
- What is she using to cut the wheat? (a scythe)
- What kind of day is it? (hot)
- What season do you think it is? (summer)
- Is she working hard? (yes)
- How do you know? (sweat)
- Is the duck, cat or dog helping her? (no)

Look at the bottom of the page.

- What is the red hen doing? (walking with a sack of wheat in a wheelbarrow)
- Where is she coming from? (the mill)
- What do they do at a mill? (wheat --> flour)
- Is the wheat heavy? (yes)
- How do you know? (sweat)
- Did the duck, the dog or the cat help? (no)

Look at the top of page 23.

- What do you see the little red hen doing? (baking)

- What kind of hat does she have on? (baker's hat)
- What is she baking? (bread)
- How many loaves? (3)
- What ingredients did she use? (flour, milk and butter)
- What utensils did she use? (a bowl, wooden spoon, rolling pin and a loaf pan)
- What did she do to the flour in the bowl? (stir it)
- What is she doing in this picture? (kneading the dough)
- Did the dog, cat or the duck help her? (no)

What is she doing at the bottom of the page? (baked the bread and is eating a slice of bread)

- What did she take off? (her apron and hat)
- What did she put on the bread? (jam)
- Do the dog, cat and duck want to help her eat the bread? (yes)
- Do you think she will let them? (no)
- Why not?

[Selective Attention]	*[Prediction]*
[Advance Organization]	*[Inferencing]*
	[Imagery]
	[Resourcing]

Prediction - guessing what the story is about; predicting what will happen next in the story
Inferencing - when answering the questions
Imagery - using the pictures to answer the questions
Resourcing - using the textbook

II. PRESENTATION - Listening

5. A. The students read the questions to themselves.
   B. The teacher reads the questions one by one, reviewing any vocabulary the students do not know, and underlines the special word(s) the students will be listening for when note taking. (This procedure is done with the help of the students.)

[Organizational Planning]
[Selective Attention]

6. The students number a piece of paper with numbers 1-9 in preparation for note-taking.

7. Modification of usual procedure: Books remain **OPEN** so the students can look at the pictures as you read.

   Read the story slowly to the students. They listen carefully for the answers to the questions. When you have finished reading the story once, ask the students where they can find some of the words for the answers (on the board from brainstorming).

[Selective Attention]
[Self-Monitoring]

[Note Taking]
[Auditory Representation]
(saying the answers in their minds as they write)
[Imagery]
[Inferencing]

8. Read the story again, more rapidly, to ensure the students have answered most of the questions. Modification: The students read orally with the teacher the third time.

Ask:

- Was your guess or prediction right?
- Did the little red hen let the duck, dog or cat eat the bread? (no)
- What helped you guess or predict the story before you read it? (pictures)

[Self-Monitoring]
[Self-Evaluation]

III. PRACTICE - Speaking and Reading

9. Assign each student a partner. Modification: With books remaining **OPEN,** students read the story to their partners. They work together on the questions, comparing their answers and checking their answers against the text. They are to check for: a) correct answers; b) correct spelling. They are given 15 minutes to complete the task.

[Self-Evaluation]

[Cooperation]
[Questioning for Clarification]

IV. EVALUATION - Speaking

10. **CLOSE** the books. The students give the teacher the correct answers and the teacher writes the answer beside the question in a different color.

V. FOLLOW UP - Writing

11. Books remain **CLOSED**. The teacher gives the students a sheet of questions (**See the end of this lesson for the question list**.) The student complete the sheet of questions, writing the answers in complete sentences.
e.g. Where does the little red hen live? (on a farm)

The teacher demonstrates how to write proper declarative sentences by using: a) most of the words in the question; b) the answers.
Modelling --> Actually underline the words in the question they will use in their answers. Do this for a few questions. Circulate and help individuals by providing cues as they are needed.

[Deduction/Induction]

e.g.
Question #1

1. Where did the little red hen live? *farm*

The little red hen lived on a farm.

Strategy Instruction:

[Selective Attention]-- *[Deduction/Induction]--*

- How would you write your answer in a complete sentence?
- What words in the question will you use in your answers?
- Let's underline them. (Underline the words in the same color as the answer so the students have a visual image to make the association.)

Where did the little red hen live?

Capitalization:

- What word would be the first word in your sentence? (the)
- What do you have to remember to put on the T in "the"? (capital letter or upper case T)
- Why? (It's the first letter in the sentence)
- Do you have to do this for all of the sentences?
- What are the next words? (little red hen)

Past tense:

- Does the little red hen live on the farm now, or did she live on the farm in the past? (in the past)
- What do we have to add to "live" to make it in the past? (ed)
- If a word like "live" already ends in "e" how do we add "ed"?
- Write: lived
- What does "did" mean, today or yesterday? (yesterday)
- When you see "did" in the question, what do you have to remember to do? (add "ed")
- What tense will that make it? (past tense)

Prepositions, articles:

- What is the next word in the sentence? (farm)
- What word or words can you use to connect farm to the rest of the sentence? (on)
- On what? (a farm)
- Write: on a farm

Punctuation:

- What do we have to put at the end of the sentence to show it is finished? (. = period)
- Write "."
- What does the question have at the end of it? (? question mark)
- What does the question mark mean? (that it is asking a question)
- When you have a period at the end of the sentence, what does that mean? (It is telling the answer)
- Let's read the complete question and answer we have written together:

Where did the little red hen live? *farm*

The little red hen lived on a farm.

Follow the same procedure for question #2 if necessary.

When the students are working on questions #4, 5, 6, 8 and 9, integrate a discussion about irregular past tense. E.g., If you don't have "did" in the question, except in question #9, you don't add "ed" to the action word or verb. It is already in the past tense in the question.

Ask the students for the present tense of the verbs so they can distinguish between present and irregular past tense verbs.

[Deduction/Induction]
(applying the rules to write the sentences)

12. Modification:

These are primary students and as this is their first content lesson, they edit their first draft with the teacher by orally reading their answers.

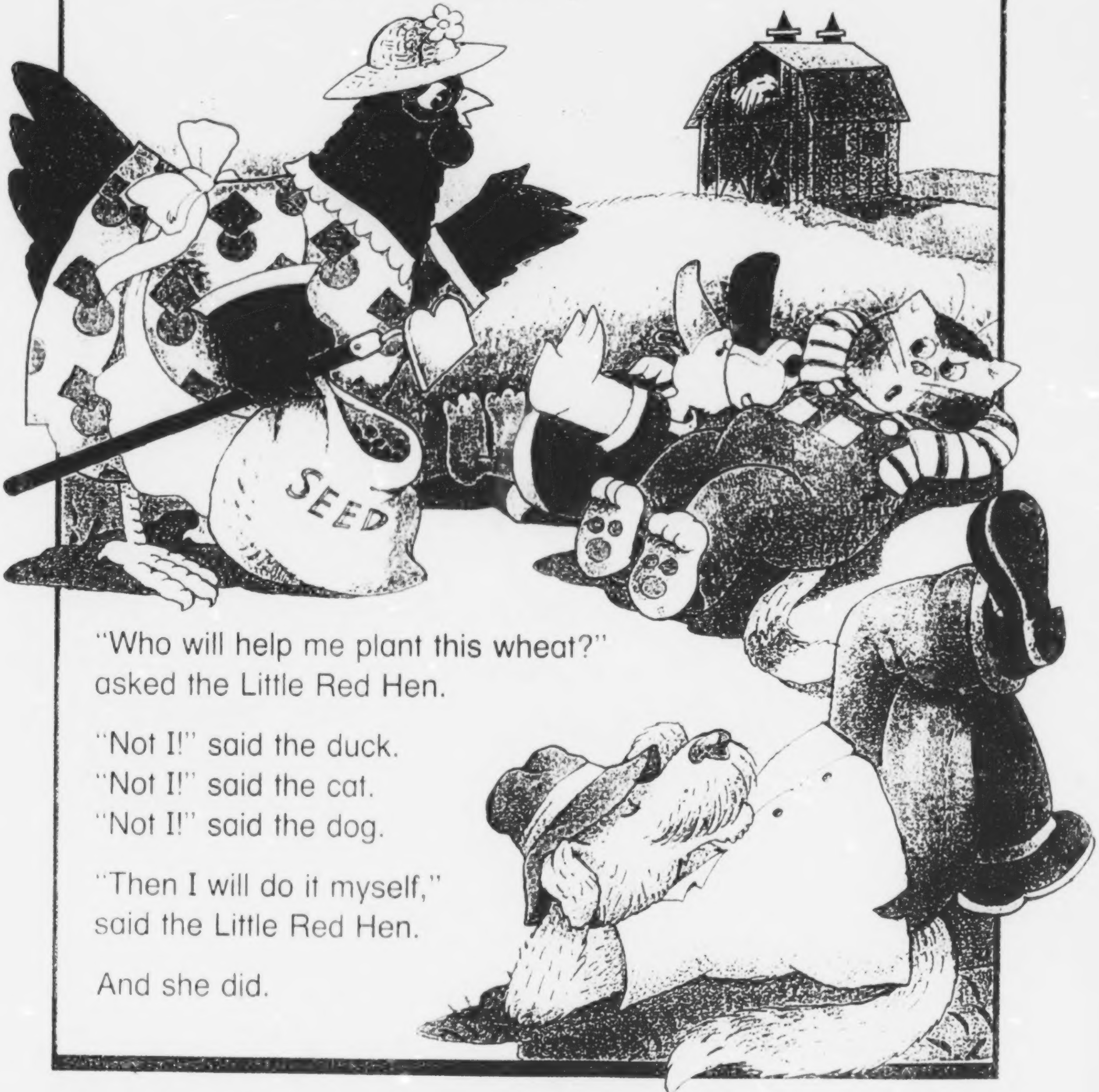
Name ____________________

The Little Red Hen

1. Where did the red hen live? ____________________
2. Who did the red hen live with? ____________________
3. Who planted the wheat? ____________________
4. Who cut the wheat? ____________________
5. Who made the flour? ____________________
6. Who made the bread? ____________________
7. Did the red hen have help? ____________________
8. Who ate the bread? ____________________
9. Why did the red hen eat the bread by herself? ____________________

The Little Red Hen

Once upon a time, there was a busy little red hen. She lived on a farm with a lazy duck, a lazy cat, and a lazy dog.



"Who will help me plant this wheat?"
asked the Little Red Hen.

"Not I!" said the duck.
"Not I!" said the cat.
"Not I!" said the dog.

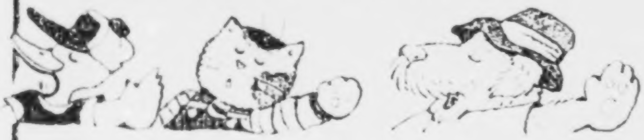
"Then I will do it myself,"
said the Little Red Hen.

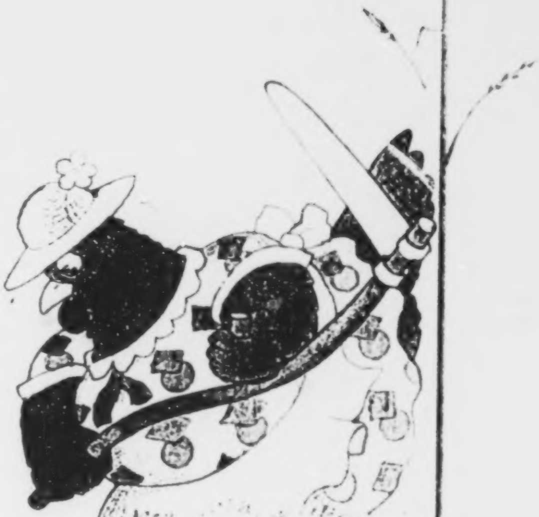
And she did.

from *Addison-Wesley ESL, Level B, Student Book,* pp. 21-23

Literature: Traditional tale
Shared reading, role play

"Who will help me cut the wheat?"
asked the Little Red Hen.



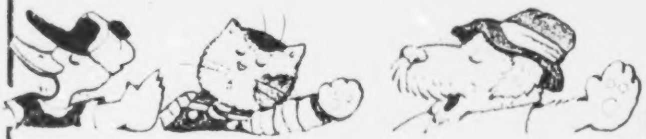


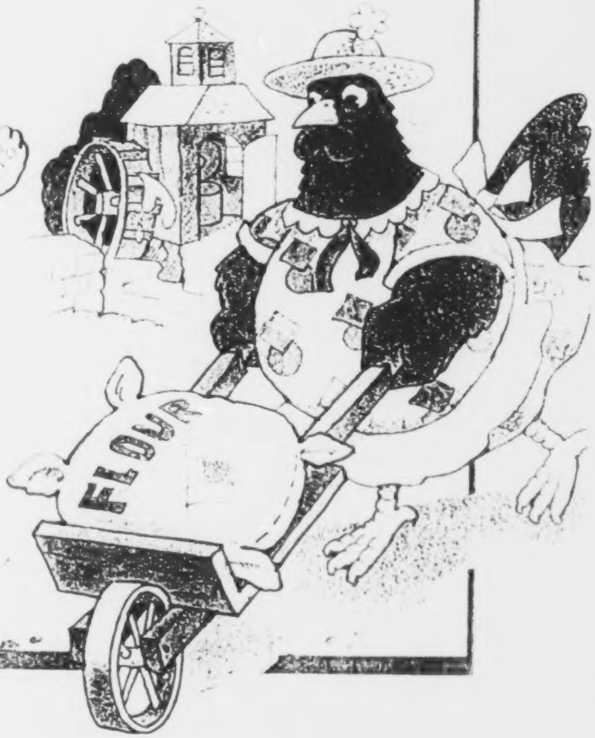
"Not I!" said the duck.
"Not I!" said the cat.
"Not I!" said the dog.

"Then I will do it myself,"
said the Little Red Hen.

And she did.

"Who will help me make the flour?"
asked the Little Red Hen.

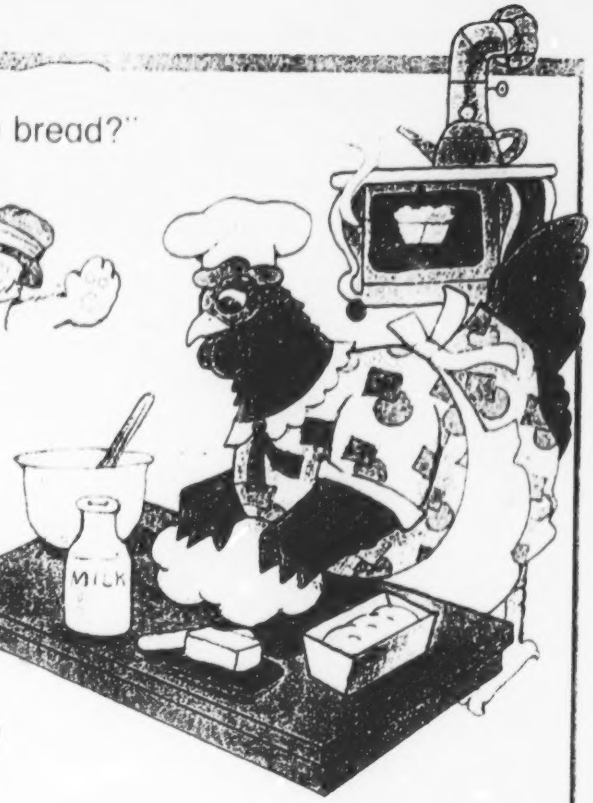




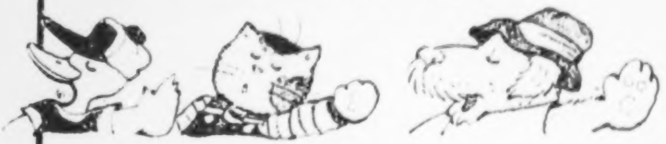
"Not I!" said the duck.
"Not I!" said the cat.
"Not I!" said the dog.

"Then I will do it myself,"
said the Little Red Hen.

And she did.



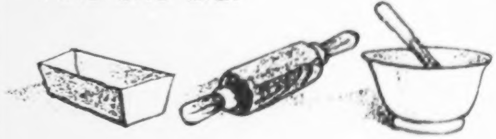
"Who will help me make the bread?"
asked the Little Red Hen.



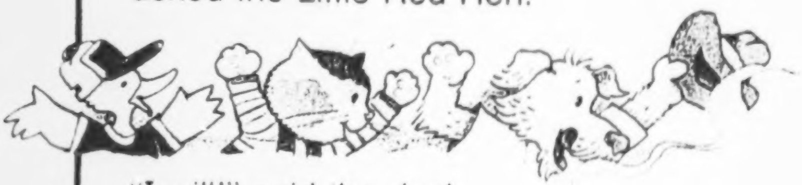
"Not I!" said the duck.
"Not I!" said the cat.
"Not I!" said the dog.

"Then I will do it myself,"
said the Little Red Hen.

And she did.



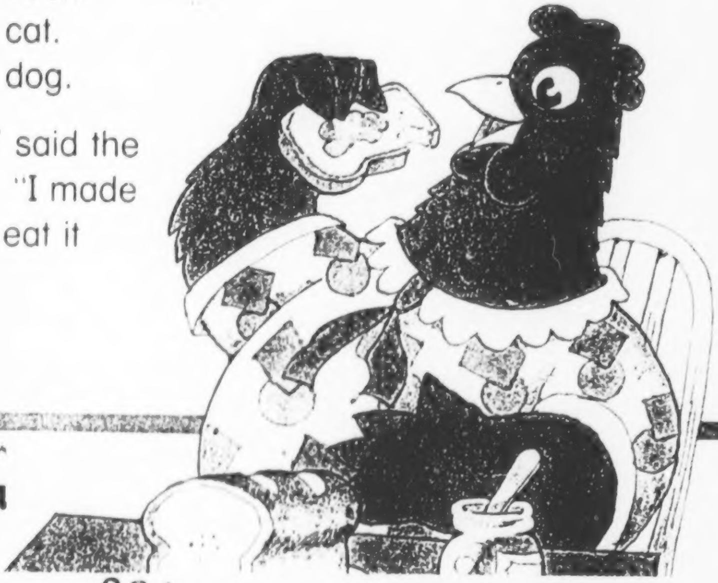
"Who will help me eat the bread?"
asked the Little Red Hen.



"I will!" said the duck.
"I will!" said the cat.
"I will!" said the dog.

"No, you won't," said the
Little Red Hen. "I made
it myself and I'll eat it
myself."

And she did.



Lesson 2: "The Little Red Hen" Follow-Up (Language Arts - Extended Activity)

Objectives:

Content Objectives:

- To develop and recognize basic sight words.
- Using words in context.
- To transfer from the visual (pictures) to the abstract (words).

Language Objectives:

Skills:

- Listening - to instructions and reading
- Speaking - to give predictions
- Reading - the story orally and silently
- Writing - correct words into sentences

Linguistic Knowledge:

Vocabulary Development:

- To reinforce the vocabulary and the story from the previous lesson -- elaborating upon prior knowledge.

Structures:

- Future tense "will"
- Direct quotations

Function:

- Writing words in context.

Learning Strategies:

Metacognitive Strategies:

- Organizational Planning
- Selective Attention
- Self-Monitoring
- Evaluation

Cognitive Strategies:

- Predicting

- Inferencing
- Elaboration
- Transfer
- Auditory Representation

Social-Affective Strategies:

- Cooperation

Materials:

- *Addison-Wesley ESL, Level B, Student Book*, pp. 21-23.
- *Addison-Wesley ESL Activity Book, Level B*, p. 14.

Procedures:

I. PREPARATION:

- Review "The Little Red Hen" using the visuals in the book.
- Read orally the story with the class, with the teacher as the narrator. Half the class will read the hen's part and the other half will read the parts of the lazy animals.
- Distribute the worksheet (from *Addison-Wesley ESL Activity Book, Level B*, p. 14 - See end of lesson) to the students. Ask the students to predict or guess what they are going to do with the worksheet. Listen to the predictions.

[Organizational Planning] *[Prediction/Inferencing]*

II. PRESENTATION:

- Ask a student to read the instructions.
- Ask the class if their predictions were correct.
- Tell them to open their books to the story and model how to do question #1 with the class. Refer to the story for the information to verify the answer.
- Fill in the blank.

[Selective Attention]	*[Auditory Representation]*
(to special words)	*[Transfer]*
	[Elaboration]
	[Inferencing]

III. PRACTICE:

- The students complete the worksheet using the text.

[Selective Attention]	*[Auditory Representation]*
[Self-Monitoring]	*[Transfer]*
	[Elaboration]
	[Inferencing]

Self-Monitoring - checking as they are filling in the blanks
Auditory Representation - saying the words to themselves as they write them
Transfer - from the book to the paper
Elaboration - visual --> abstract
Inferencing - guessing the correct word as they fill in the blank

IV. EVALUATION:

- When the worksheet is completed the students are instructed to read their worksheet to another student.

[Self-Evaluation] *[Cooperation]*

V. FOLLOW-UP:

- The students read the worksheet to the teacher.

[Self-Evaluation] *[Cooperation]*

Lesson 1 and 2 Note:

Although the worksheets in lessons 1 and 2 are simple worksheets providing no visual motivation, it is important to do these types of worksheets. The students, ESL students included, do precisely these kinds of worksheets in their classrooms. It is not important whether this practice is right or wrong; ESL teachers should not judge but should complement the learning experiences and activities occurring in the regular classrooms, assisting their ESL students to bridge the gap.

The learning strategies, although incorporated into the lessons, are not specifically elaborated upon in these first two lessons. Some of the strategy words are merely mentioned to familiarize these young students with the names of the strategies. A way of reinforcing the names of the learning strategies would be to print them on the chalkboard as they are said.

Read the sentences. Write the missing word.

1. Once there was a little ____________ hen.

red bed read

2. "Who will help me ____________ the wheat?" she asked.

play ride plant

3. "Not I," said the duck, the cat, and the ____________.

dog frog bird

4. "Who will help me ____________ the bread?" she asked.

plant feed eat

5. "I ____________!" said the duck, the cat, and the dog.

do am will

6. "No you ____________." said the Little Red Hen.

won't will can't

7. "I ____________ it myself and I'll eat it myself," she said.

made packed talked

(After Level B, student pages 21–23) **Developing basic sight word vocabulary; using words in context.** Students circle and copy the correct word to complete each sentence. Check orally; give each student a chance to read aloud.

from *Addison-Wesley ESL, Level B, Activity Book*, p. 14

Lesson 3: The Path of Wheat (Language Arts, Science)

Objectives:

Content Objectives:

- To understand the sequential order of the path of wheat.

Language Objectives:

Skills:

- Listening - to instructions
  - brainstorming to each other
- Speaking - brainstorming and discussion
- Reading - for information and to give information
- Writing - sentences to describe the pictures

Linguistic Knowledge:

Vocabulary Development:

- pig, flour, thresh, compare, different, same, Venn diagram, steps --> plants --> cuts --> threshes --> carries --> makes --> eats, path --> seeds --> wheat --> flour --> bread, grouping, summarizing, characters, characteristics, setting, tools, scythe, sickle, wheelbarrow, field, farm, mill, kitchen

Structures:

- subject-verb agreement
- pronouns
- plurals

Discourse Features:

- first, second, third, fourth, fifth, sixth

Function:

- writing complete sentences in sequential order.

Learning Strategies:

Metacognitive Strategies:

- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Inferencing
- Imagery
- Grouping
- Summarizing
- Classifying
- Transfer
- Deduction/Induction
- Elaboration

Social-Affective Strategies:

- Cooperation
- Questioning

Materials:

- *Addison-Wesley ESL, Level B, Student Book*, pp. 21-23.
- *Santillana Primary Level B*, Posters, poster 17. **(See end of lesson)**
- *Santillana Primary Level B*, Focus Sheet 9.3, p. 47. **(See end of lesson)**

Note: See Chapter 2 for information on these publications.

Procedures:

I. PREPARATION:

Review the sequential order of the path of wheat in "The Little Red Hen" in *Addison-Wesley ESL, Level B, Student Book*, pp. 21-23 (or whatever book was used in lessons 1 and 2).

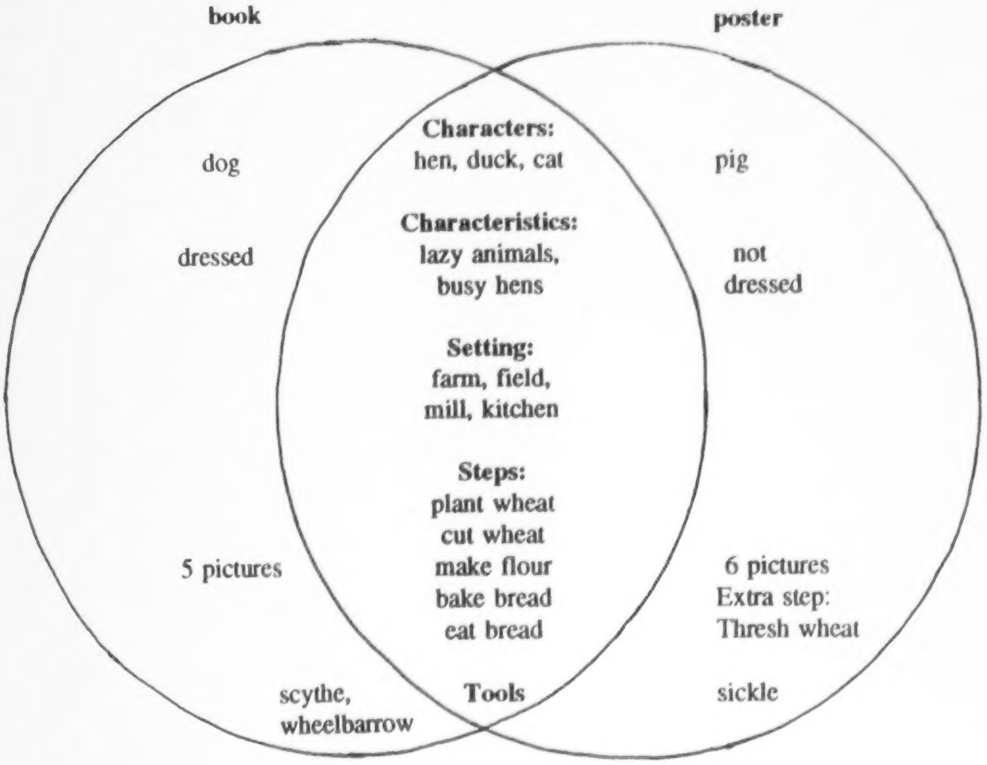
- Plant wheat
- Cut wheat
- Make flour
- Make bread
- Eat bread

Show the students *Santillana Primary Level B*, Poster 17 of The Little Red Hen (See end of lesson).

Ask:

- How many pictures are there of the Little Red Hen? (6)
- Is this poster the same as the story in the book? (yes and no)
- Compare the book to the poster. Use a Venn diagram to list what is the same and different.

The Little Red Hen


book
poster
Characters:
hen, duck, cat
dog
pig
Characteristics:
lazy animals,
busy hens
dressed
not
dressed
Setting:
farm, field,
mill, kitchen
Steps:
plant wheat
cut wheat
make flour
bake bread
eat bread
5 pictures
6 pictures
Extra step:
Thresh wheat
scythe,
wheelbarrow
Tools
sickle

As the teacher and students are brainstorming to complete the Venn diagram, ask the following questions. After eliciting each answer, ask where the words should be placed in the Venn diagram.

- Which animals are characters in *both* stories? (hen, duck, cat)
- Which characters are *different* in the two stories? (dog, pig)
- What are the animals like in both stories? (lazy animals, busy hen)
  [State to students: "These are their *characteristics*."]
- Are they dressed in both stories? (no)
- Where are they dressed/not dressed? (book/poster)
- Where do the stories take place? (farm, field, mill, kitchen)
  [Tell students: "Each of these is part of the *setting*."]
- Is the setting the same for both stories? (yes)
- Are the steps for the path of wheat the same in both stories? (no)
- Which steps are the same? (planting wheat, cutting wheat, making flour, baking bread, eating bread)
- Which story has a different step? (the poster)
- What is the Little Red Hen doing in the third picture on the poster? (beating or hitting the wheat)
- What is happening to the seeds as she does this? (they fall off the wheat plant)
- What is it called when you separate the seeds from the plant? (threshing)
- Why does she want to thresh the wheat? (to separate the seeds)

- Where does she go after she threshes the wheat? (to the mill)
- What part of the plant does she take to the mill? (the seeds)
- How does she take the seeds to the mill? (in the story, by wheelbarrow; in the poster, she carries them)
- We can call the wheelbarrow a *tool*, something we use to help us do something. Does she use any different tools in the two stories? (yes, scythe in story and sickle in poster)
- What happens to the rest of the plant?
- Have you ever seen hay in a field?
- Have you ever gone on a hay ride?

Strategy Instruction:

[Grouping]--

- What did we do with the poster and the story? (compared them)
- When you compare what two things do you look for? (what is the same and what is different)
- What did we use to compare them? (circles) This is called a **Venn diagram**.
- Did the circles or Venn diagram help you to see what was the same and what was different?
- If something was the same in both the book and on the poster, where did we put it? (in the middle of the circles)
- If something was different where did we put it? (in the outside circle)
- What are we doing when we put all the same things in their proper places like this? (grouping)
- Grouping (write it on the board) is a learning strategy that helps us to understand and remember.
- By looking at how we grouped what was the same and different in this diagram, does it make it easier to understand?

[Organizational Planning] *[Elaboration]*
[Inferencing]
[Grouping]
[Classifying]

Elaboration - moving from the book --> poster
Inferencing - as you fill in the Venn diagram
Grouping - similarities and differences on the Venn diagram
Classifying - information; e.g. characters, characteristics, setting, steps, tools

II. PRESENTATION:

Use the Venn diagram and the poster to discuss the path of the seeds.

Ask:

- What is the Little Red Hen doing in the first picture? (planting the seeds)
- What is she doing in the second picture? (cutting the wheat)
- What is she doing in the third picture? (threshing the wheat)

- What is she doing in the fourth picture? (carrying the wheat)
- Where? (to the mill)
- What is she doing in the fifth picture? (making bread)
- What is she doing in the sixth picture? (eating bread)
- What did she start with? (seeds)
- What did the seeds grow into? (wheat)
- Where did she take the wheat seeds? (mill)
- What were the wheat seeds made into at the mill? (flour)
- What did she make or bake with the flour? (bread)

Strategy Instruction:

[Summarizing]--

- Let's summarize the path of the wheat beginning with the seeds.

Seeds --> __________ --> __________ --> __________

- What did you get?

Seeds --> Wheat --> Flour --> Bread

- Does summarizing (write it on the chalkboard) the path of a wheat seed make it easier to understand and remember?

[Summarizing] (the path of a seed)

III. PRACTICE:

- Distribute the worksheet (from *Santillana Primary Level B*, Focus Sheet 9.3, p. 47).

Discuss:

- Let's write down what she is doing in each picture. [The pictures are not in sequential order, but write them out of order just as they are in the pictures. The students will write them in sequential order in the evaluation phase.]

Strategy Instruction:

[Imagery]--
[Deduction/Induction]--

Ask:

- Is the Little Red Hen a lady or a man? (a lady)
- If she is a lady, do we write "he" or "she"? (she)
- What do we write on the "S" in "she" if it is the first letter of the sentence? (capital S or upper case S)
- What is she doing in the first picture? (She threshes the wheat.)

- What is she doing in the second picture? (She makes the bread.)
- What do we add to thresh? (es)
- Why? (If it ends with "sh", add "es")
- What is she doing in the third picture? (She plants the seeds.)
- Why did you put an "s" on "seeds"? (She planted more than one.)
- What is she doing in the fourth picture? (She carries the wheat.)
- How do you spell carry?
- When you add "s" to carry, what do you have to remember? (If it ends in "y", drop the "y" and add "ies")
- Where does she carry the wheat? (to the mill)
- Let's add that to our sentence. (She carries the wheat to the mill.)
- What is she doing in the fifth picture? (She eats the bread.)
- What is she doing in the sixth picture? (She cuts the bread.)
- What do you have to remember to put at the end of each sentence? (period)
- Are these pictures in the proper order? (no)
- Cut out the pictures and place them in the proper order. You may work with a partner. You have three minutes. Raise your hand when you are finished.

When the students complete the task instruct them to put the correct numbers in the appropriate boxes and to glue them, in their proper order, onto a piece of construction paper.

[Self-Monitoring]
[Self-Evaluation]

[Inferencing]
[Imagery]

[Cooperation]
[Questioning for Clarification]

Inferencing - guessing the order.
Imagery - using the pictures.

IV. EVALUATION:

Once the visuals are glued in sequential order, refer the students to the sentences (from the practice phase) on the chalkboard. These are out of sequence.

Ask:

- Are these sentences in the same order as your pictures? (no)
- Work with your partner and write the correct sentence on the lines below the correct pictures. (Note: If the students are proficient enough, they can create their own sentences.)

Give the students a time limit, e.g. 10 minutes. When they complete the task, instruct them to read their sentences to their partners to check them.

[Self-Monitoring]
[Self-Evaluation]

[Inferencing]
[Transfer]
[Elaboration]
[Deduction/Induction]

[Cooperation]
[Questioning for Clarification]

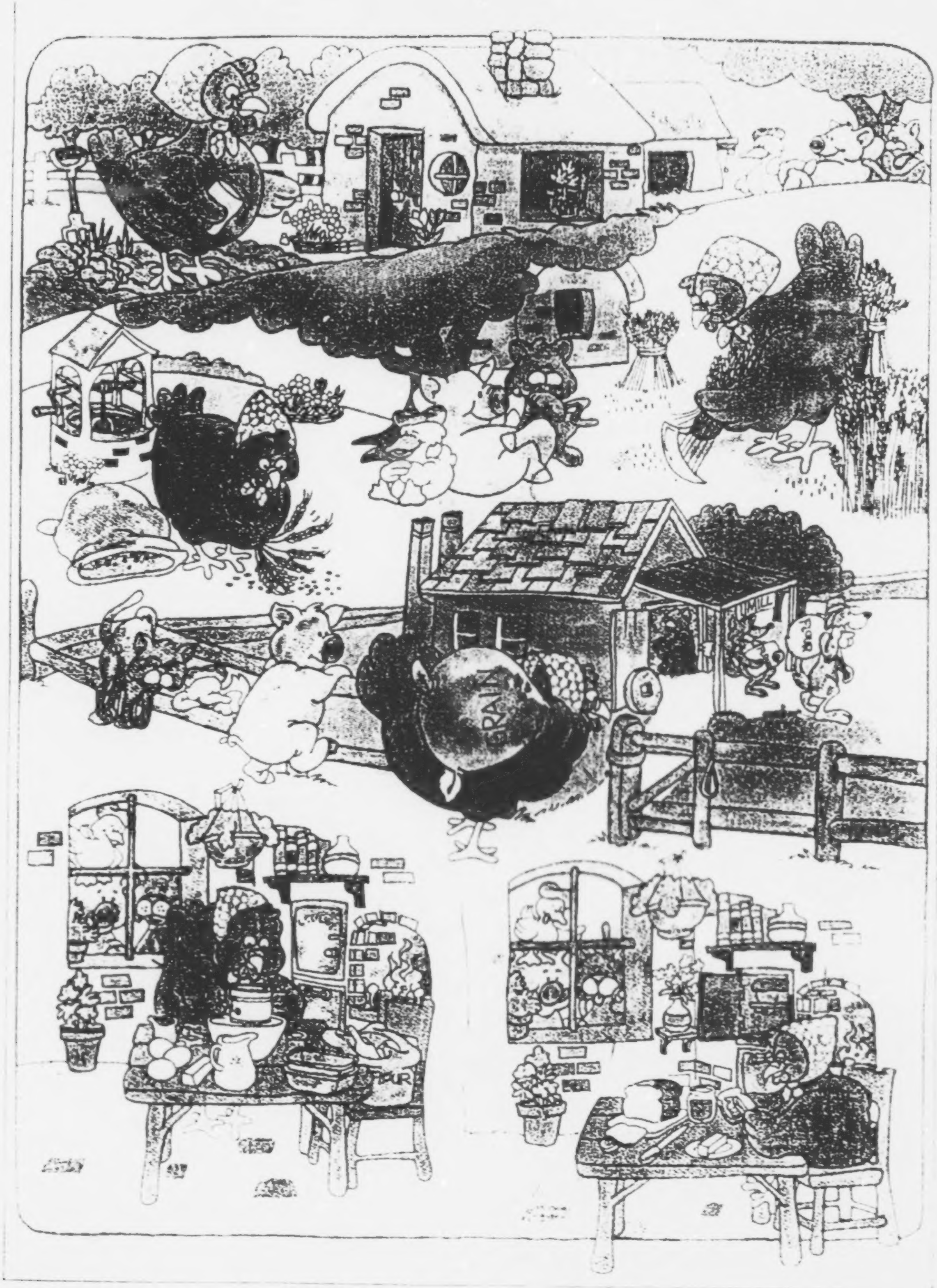
Inferencing - guessing which sentences to write.
Transfer - visuals and sentences to the task.
Elaboration - visuals --> words.
Deduction/induction - writing correct sentences.

V. FOLLOW-UP:

Students read their final draft to the teacher. They may color their pictures.

[Self-Evaluation]

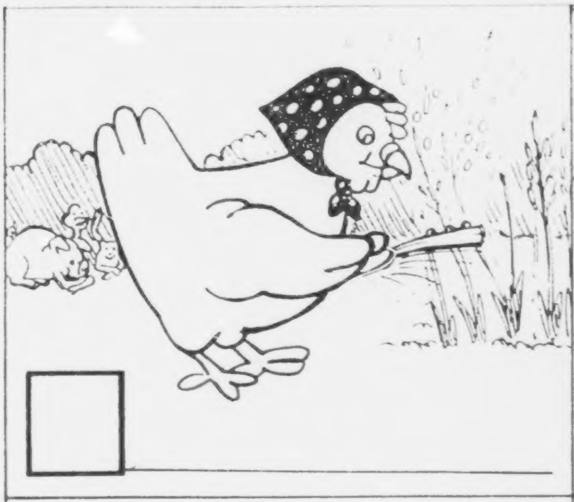
Santillana *Bridge to Communication*, Primary Level B, Poster 17

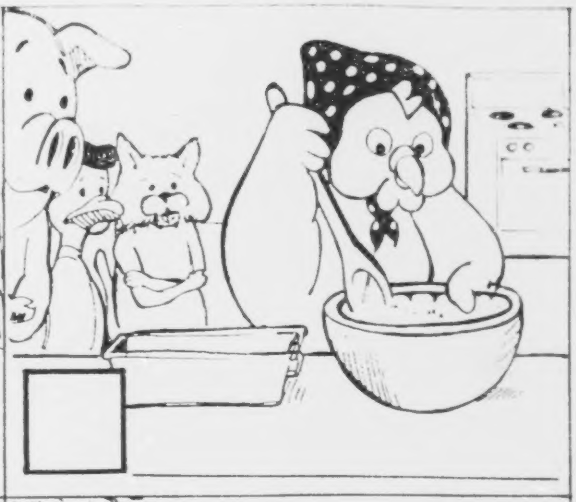

GRAIN
MILL
FLOUR

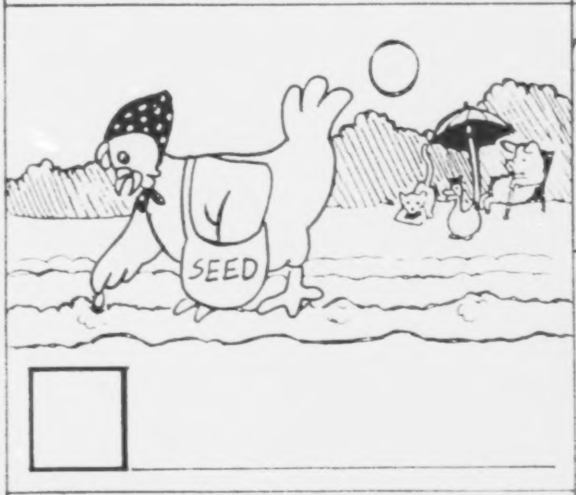
Poster 17

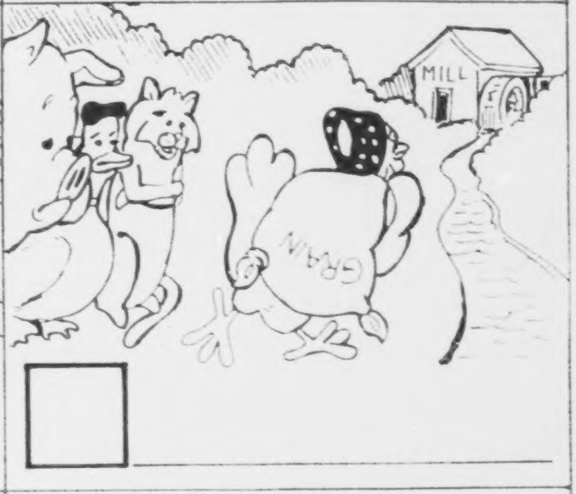
FOCUS SHEET **9.3**

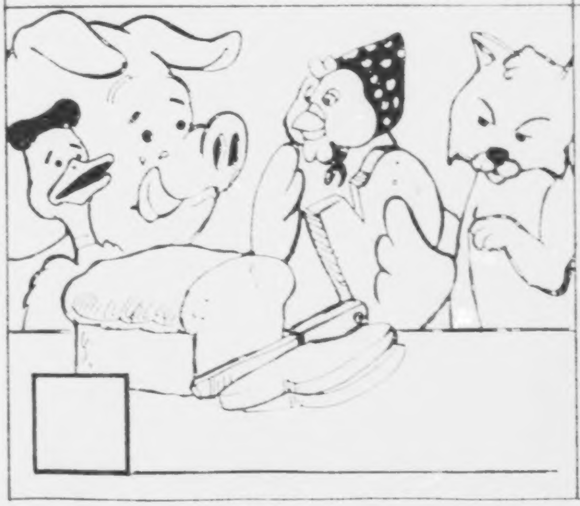
Name ______________________

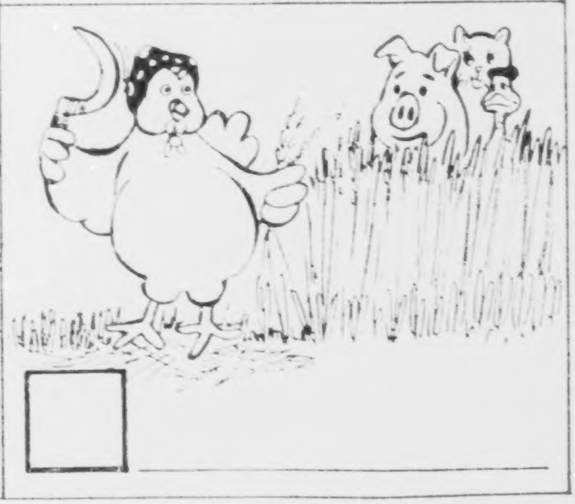












The Little Red Hen

Learning Log - Lessons 1, 2, 3

VOCABULARY I KNOW:

Clothing

_____ apron
_____ baker's hat
_____ cap
_____ dress
_____ hat
_____ jeans
_____ overalls
_____ shirt
_____ sweater
_____ T-shirt
_____ workboots

Verbs

_____ bake
_____ carry
_____ eat
_____ knead
_____ make
_____ plant
_____ stir
_____ sweat
_____ thresh

Animals

_____ cat
_____ chicken
_____ dog
_____ duck
_____ hen
_____ pig

Places

_____ barn
_____ farm
_____ field
_____ mill

Wheat

_____ bread
_____ dough
_____ flour
_____ seeds
_____ slice

Tools

_____ hoe
_____ sickle
_____ scythe
_____ wheelbarrow

Utensils

_____ bowl
_____ loaf pan
_____ rolling pin
_____ wooden spoon

Adjectives

_____ busy
_____ lazy

Antonyms

_____ different
_____ same

LANGUAGE:

I can:

_____ Listen for information.
_____ Read the questions.
_____ Read the story.
_____ Read the sentences.
_____ Write missing words in the sentences.

CONTENT:

I can:

_____ Explain the path of a wheat seed.
_____ Explain how plants grow.
_____ Tell the steps the hen takes.
_____ Tell how the story is the same and different.
_____ Explain a Venn diagram.

LEARNING STRATEGIES:

I can:

_____ Use what I know to understand new information.
_____ Take notes.
_____ Listen for special words.
_____ Predict.
_____ Cooperate with others.
_____ Ask others questions.

Lesson 4: The Bakery (Language Arts, Mathematics)

Objectives:

Content Objectives:

- Classifying baked goods according to quantity.
- To learn about prices and money.
- To elaborate upon baked goods made from flour.
- To transfer the vocabulary to a real life situation of shopping in a bakery.
- To practise addition.

Language Objectives:

Skills:

- Listening - for information
    - to a partner when working together
- Speaking - to give information
    - when working with a partner
- Reading - fliers
- Writing - information on the chart
    - baked goods, quantities and prices on the shelves in their bakeries

Linguistic Knowledge:

Vocabulary Development:

- baked goods - buns, rolls, biscuits, cakes, pies, muffins, doughnuts, cookies, bagels, bread, croissants, cheese sticks; bakery
- quantity - dozen, each, bulk, package, bag, loaf, box
- Money - $, dollar, ¢, cents, coins, dollar bills, . = decimal, 1¢ = penny, 5¢ = nickel, 10¢ = dime, 25¢ = quarter, $1 = loonie, bill

Structures:

- Singular/plural
- The structure "a _____ of _____ " (e.g. a loaf of bread).
- The structure "a ____ ____ " (e.g. a dozen buns).

Functions:

- Naming, grouping and classifying baked goods according to quantity and price.
- Writing in point form.

Learning Strategies:

Metacognitive Strategies:

- Selective Attention
- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Imagery
- Resourcing
- Elaboration
- Transfer
- Classifying
- Grouping
- Summarizing

Social-Affective Strategies:

- Cooperation
- Questioning

Materials:

- Bag of flour.
- Several different fliers with visuals of baked items.
- Chart (teacher made).
- *Santillana Primary Level B*, Student Work Sheet 9.3, p. 51 (**See end of lesson**).

Procedures:

I. PREPARATION:

Review the path of a wheat seed.

Seed --> wheat --> flour --> bread

Refer to the flour. Show a small bag of flour. Ask:

- What else can you make from flour? Write their responses on the board.
- Have you ever been to a little bakery?
- What do you buy in a bakery? (baked goods - the students will name more goods made from flour. Write their responses on the board).
- Why is a place where you buy baked goods called a bakery?
- What is the root word of "bakery"? (bake)
- Can you buy baked goods in a big store?
- In what department? (bakery)

Distribute different fliers to pairs of students.

- What have I given you? (fliers)
- Where do you get fliers from? (newspapers, mail boxes)
- What do fliers tell you? (How much things cost - advertise)
- Turn to the page with pictures of baked goods or the bakery department.
- I will give you and your partner 3 minutes to look through your flier. List all the baked goods made from flour you can find in your flier or that you can think of.

[Organizational Planning]
[Selective Attention]
[Imagery]
[Resourcing]
[Transfer and Elaboration]
[Cooperation]
[Questioning for Clarification]

Organizational Planning - writing on the board the words which will be used later.
Selective Attention - looking for specific words in the fliers.
Imagery - using pictures from the fliers to obtain the necessary vocabulary.
Resourcing - using the fliers.
Transfer and Elaboration - using previous knowledge about wheat and flour to understand the new information about other baked goods.
Questioning for clarification - when working with partners.

Brainstorm with the class to list all the baked goods they have found in the flier. Ask the students to show the pictures of the baked goods. Write the names of the baked goods randomly on the board.

Strategy Instruction:

[Imagery]--

- We have written many names of baked goods on the board. Let's review them. (Students will show the pictures in the fliers as the following questions are asked.)
    - What are croissants?
    - What are bagels?
    - What are cheese sticks?
- How do you know what they are? (from the pictures)
- Did you know the names of these baked goods before?
- Will you remember the names now?
- What helped you to understand and remember the names of these baked goods? (the pictures)

[Resourcing]--

- Where did we get the pictures from? (the flier)
- Have you looked through the fliers at home?
- What else do they have in the flier?
- Can you learn anything from these fliers?

- Why are these fliers sent to your home?
- Who sends these fliers?
- Why do big stores send fliers to your home?
- How do the fliers arrive at your home? (newspaper, delivered)
- Do your mother and father read these fliers?
- Why?
- Why do you think these fliers have such good pictures?
- Using fliers is a good resource to help us understand the words because they have good what? (colored pictures)

[Transfer]--
[Elaboration]--

- What did you learn about wheat yesterday? (the path of wheat)
- What did the Little Red Hen make from her wheat? (bread)
- What else can you make or bake from wheat, which is made into flour?
- What new words did you learn today?
- Did you know all these baked goods were made from flour, which comes from wheat?
- Today you have built upon or elaborated upon what you already knew about wheat and flour.

II. PRESENTATION:

- Look at all the baked goods we have listed on the board.
- How do you buy them?
- Instruct the students to work with their partner to look through their fliers to find how they buy each of the baked goods listed in their flier. Give them a time limit, e.g. 3 minutes.
- At the end of 3 minutes ask the students to give you the quantities. Write the quantities beside the baked goods on the board. They will be mixed all over the board e.g. doughnuts - dozen, each; cake - each; bread - loaf; etc.
- Give the students a chart.

Strategy Instruction:

[Organizational Planning]-- *[Classification & Grouping]--*

Ask:

- What have I given you? (a chart)
- What is a chart?
- What do you think we are going to do with this chart? (put the baked goods in the columns)
- What are we going to put in the top boxes of the chart? (headings)
- What headings could we use? (quantities - dozen, each, package, loaf, box)
- Let's write them in together.

Dozen	Each (bulk)	Package (bag)	Loaf	Box

Instruct the students to group each baked good listed on the board, according to its classification or quantity. Model one or two baked goods for each classification, to ensure they understand the task. Tell them to group the other listed baked goods in the appropriate or correct columns. They may work in pairs or groups. Assign a leader for each group. They each complete the chart as the discussion proceeds. Give a time limit - e.g.,5 minutes.

[Self-Monitoring]

At the end of the time limit, complete a master chart on the transparency. The students give you: a) correct information; b) correct spelling.

[Self-Evaluation]

Strategy Instruction:

[Grouping]--

Ask:

- Which is easier to understand and remember - the chart or when they were written all over the board? (the chart)

- Why?
- Does grouping the baked goods in columns make it easier to remember how you buy them?

[Selective Attention]
[Self-Evaluation]

[Classifying]
[Grouping]
[Resourcing]

[Cooperation]
[Questioning]

Selective Attention - to baked good words and quantity words.
Classifying - quantity headings.
Grouping - baked goods.
Resourcing - using fliers.
Questioning - in group work.

Repeat this procedure with prices for the quantities of the baked goods. The students are instructed to write the price (in their fliers) beside the baked goods on their charts.

Discuss vocabulary associated with money and prices.

e.g. 1¢ = penny
5¢ = nickel
10¢ = dime
25¢ = quarter
$1.00 = loonie (all of these are coins)

. = decimal
$ = dollars
¢ = cents

Discuss which is the cheapest way to buy baked goods.

[Selective Attention]
[Self-Monitoring]
[Self-Evaluation]

[Resourcing]
[Grouping]
[Elaboration]
[Transfer]
[Summarizing]

[Cooperation]
[Questioning]

Selective Attention - prices
Resourcing - using fliers
Grouping - money or price to buy baked goods
Elaboration - baked goods --> quantity --> price
Transfer - money --> price --> quantity
Summarizing - chart
Questioning - in group work

Strategy Instruction:

[Summarizing]--

- Look at the chart. What have you made? (a summary)
- What is listed on the chart? (all the baked goods, the quantity or how you buy them, and their prices)
- Is this chart a good summary of the information?
- Is this easy to understand?
- Why?

III. PRACTICE:

Distribute *Santillana Primary Level B*, Student Work Sheet 9.3, p. 51 (See end of lesson).

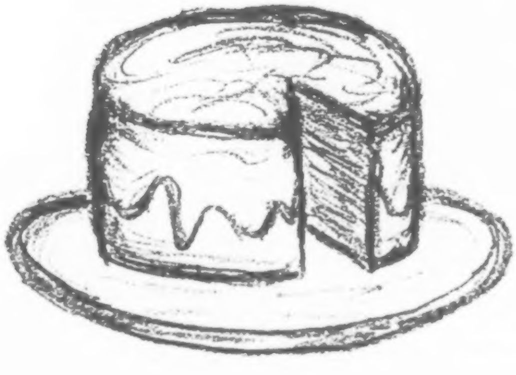
Ask a student to read the instructions. Then ask the students what they are to do?

Give additional instructions:

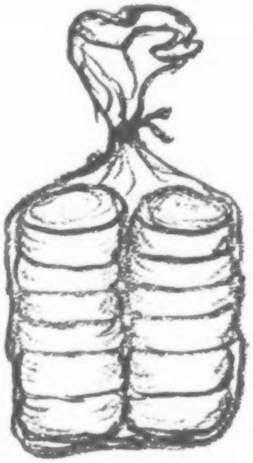
- Using your charts I want you to design your own bakery on this worksheet. I want you to do 4 things:

  1. Draw the baked goods.
  2. Write the name of the baked good under the picture.
  3. Write the prices.
  4. Write the quantity.

Model two examples for the students. E.g. →



Cake
$4.95 each



Tea biscuits
$2.00 / dozen

(Introduce "/" = "per")

IV. EVALUATION:

The students read their bakery worksheets to the teacher (when completed) for correction.

[Self-Monitoring]
[Self-Evaluation]

[Elaboration]
[Transfer]
[Summarizing]

Elaboration - baked goods --> quantity --> price --> pictures
Transfer - money --> price --> quantity --> bakery
Summarizing - chart --> bakery shelves

V. FOLLOW UP:

The students are assigned to different partners. They shop from each other's bakery worksheet. While one partner shops, the other partner lists:

- the baked good
- the quantity
- the price

When the shopping list is completed, they add up the total price or SUM on the BILL.

(Review addition and all the terms associated with addition: sum, addends, plus and equals.)

The students reverse roles. The teacher circulates to give assistance when needed.

[Self-Monitoring]
[Self-Evaluation]

[Transfer]
(bakery picture
worksheet --> shopping bills)

[Cooperation]
[Questioning]

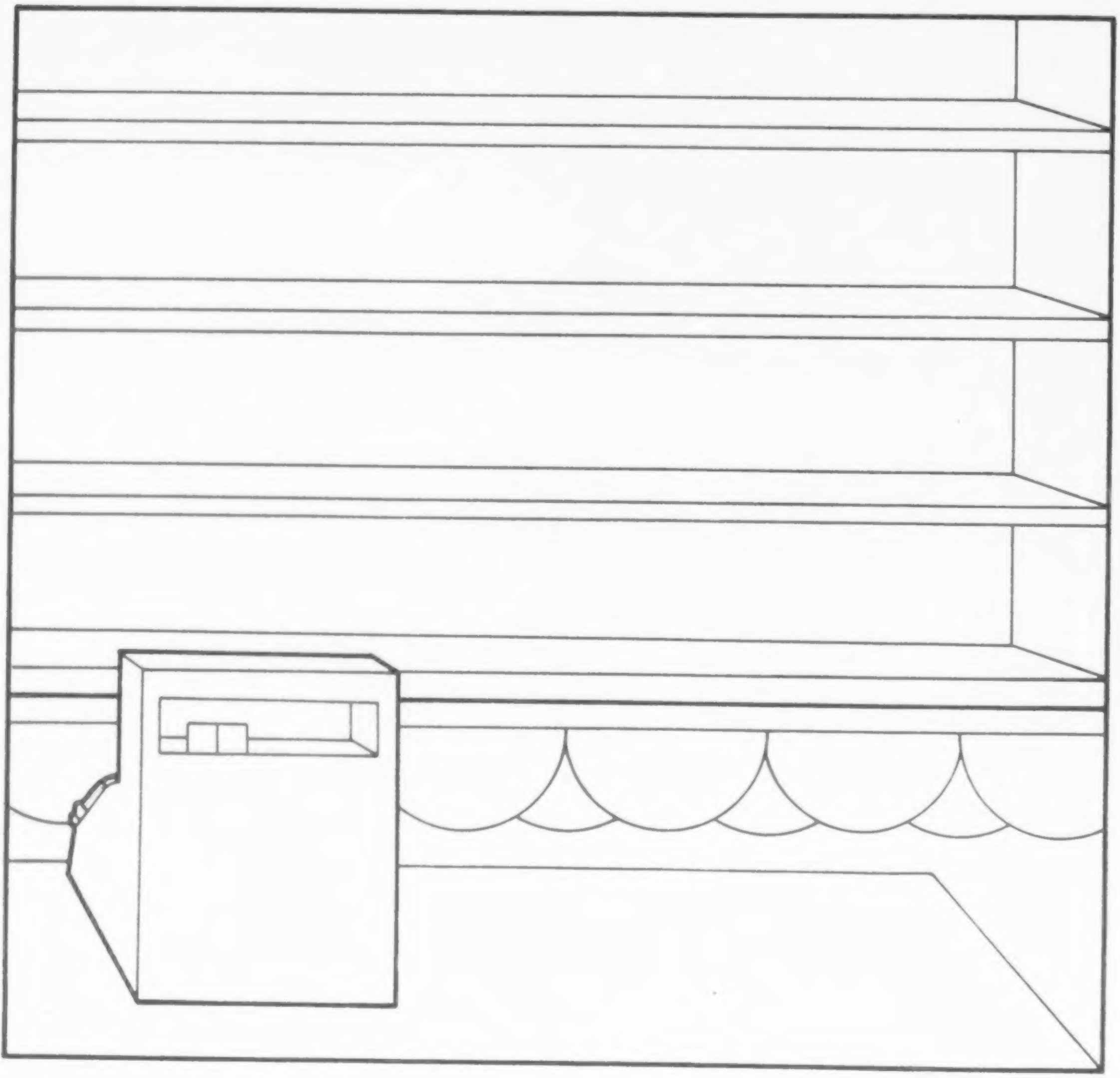
STUDENT
WORK SHEET **9.3**

Name ______________________

Little Red Hen's Bakery

Little
Red
Hen's
Bakery

■ The Little Red Hen's bread was so delicious that she started her very own bakery! On the shelves of her bakery, draw what else the Little Red Hen bakes.



Purpose: Cognitive Skill Development. ***Answers will vary.***

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The Bakery

Learning Log - Lesson 4

VOCABULARY I KNOW:

Baked Goods

_____ bagels
_____ biscuits
_____ bread
_____ bread sticks
_____ buns
_____ cakes
_____ cookies
_____ croissants
_____ doughnuts/donuts
_____ muffins
_____ pies
_____ rolls

Quantity

_____ bag
_____ box
_____ bulk
_____ each
_____ dozen
_____ loaf
_____ package
_____ per
_____ slice
_____ unsliced

Money

_____ amount
_____ bill
_____ bills
_____ cents
_____ change
_____ coins
_____ dime
_____ dollars
_____ loonie
_____ nickel
_____ penny
_____ price
_____ quarter

Addition

_____ add
_____ addends
_____ plus
_____ sum
_____ total

Nouns

_____ fliers

LANGUAGE:

I can:

_____ Understand singular and plural.
_____ Write information on a chart.
_____ Read and write prices.
_____ Read and write quantity.

CONTENT:

I can:

_____ Name baked goods made from flour.
_____ Explain quantity.
_____ Understand prices and money.
_____ Complete a chart.

LEARNING STRATEGIES:

I can:

_____ Use pictures to understand new information.
_____ Read fliers for information.
_____ Use what I know about flour to understand new information.
_____ Group on a chart.

Lesson 5: Parts of a Plant (Science)

Objectives:

Content Objectives:

- To know the different parts of a plant.
- To classify vegetables according to the parts we eat.

Language Objectives:

Skills:

- Listening - for information
  - in discussions with the group
- Speaking - to give information in group discussions
- Reading - cards and charts
- Writing - charts

Linguistic Knowledge:

Vocabulary Development:

- plant parts - roots, stems, leaves, seeds
- vegetables - lettuce, cabbage, brussels sprouts, spinach, carrots, beets, radishes, potatoes, cooking onions, turnips, parsnips, green onions, asparagus, celery, corn, peas, beans
- edible, ground, earth, soil

Structures:

- vegetables are named in the plural form when generalized

Functions:

- academic function of naming and classifying edible parts of a vegetable

Learning Strategies:

Metacognitive Strategies:

- Advance Organization
- Selective Attention
- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Imagery
- Elaboration
- Classifying
- Grouping
- Inferencing
- Resourcing

Social-Affective Strategies:

- Cooperation
- Questioning

Materials:

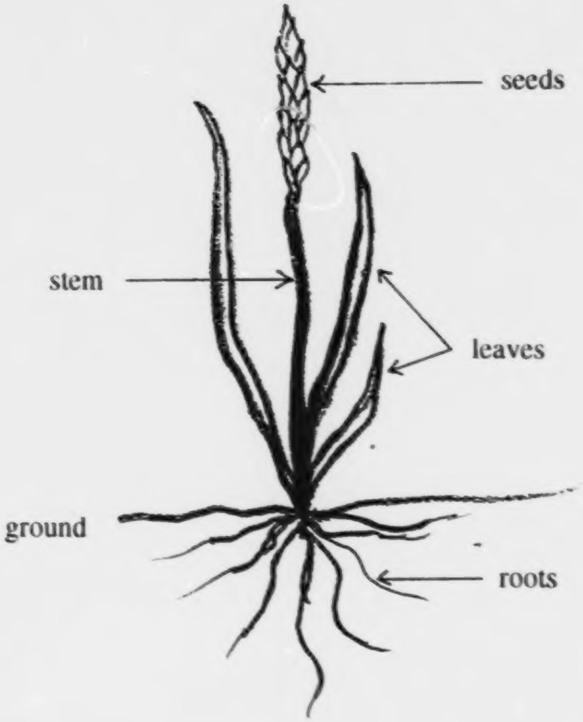
- Construction paper and glue
- Magazines and fliers
- Picture cards of vegetables with the name of the vegetable printed on the back. (DLM Kit or teacher made.)
- *Santillana Primary Level B*, Focus Sheet 9.2, p. 46.
- Chart (teacher made).

Roots	Stems	Leaves	Seeds

Procedures:

I. PREPARATION:

Review the wheat plant. Draw a picture of a wheat plant and label each part according to how it grows from the ground up.



Discuss the purpose of each part.

Ask:

- What grows first? (roots)
- Where do the roots grow? (under the ground)
- What is the ground made of? (soil, earth)
- What do the roots come from? (the wheat seed)
- What grows up from the roots? (stem)
- Where does the stem grow to? (up above the ground)
- What grows from the stem? (the leaves)
- What grows last? (the seeds)
- What two things can we do with the wheat seeds? (plant them or make flour and eat them)
- What part of the wheat plant do we eat? (seeds)
- What do we call the part of the plant we eat? (edible)

[Advance Organization]	*[Imagery]*
[Selective Attention]	*[Elaboration]*

Advance Organization - parts of a plant
Selective Attention - of key words, the parts of a plant.
Imagery - using a picture to understand the parts of a plant.
Elaboration - wheat plant --> parts of a wheat plant.

II. PRESENTATION:

Write the different parts of the plant on the board.

seeds
leaves
stems
roots

Show pictures of other vegetables (from the DLM Kit or teacher made). Ask the students:

1. the names of vegetables
2. the part they eat

e.g. cooking onions --> roots

Write the names of the vegetables above the pictures as you place them on the chalkboard ledge.

Show as many pictures as possible to increase and build their vocabulary. Most of the students do not know the names of most vegetables; they only know the names of the vegetables they eat.

Once all the cards have been placed on the ledge, play a game to reinforce the vegetable names and the parts of the plant (from *Open Sesame, Stage D, Prairie Dawn's Purple Book, Teacher's Book*, p. 20). Divide the class into two teams. Team 1 will name a vegetable to a student on team 2. The student on team 2 has to name the part of the plant we eat (e.g. celery --> stem). Play this game for a few minutes.

Modification of this game:

As the students learn the names of the vegetables place the cards on the chalkboard ledge without the names above the pictures. The student on team 1 will name a vegetable. The student on team 2 must:

a) point to the correct picture.
b) name the part we eat.

[Selective Attention]
[Organizational Planning]

[Imagery]
[Classifying]
[Grouping]
[Inferencing]
[Elaboration]

[Cooperation]

Imagery - using the pictures to name the vegetables.
Classifying - naming the part of the plant.
Grouping - the plant according to the part of the plant we eat.
Inferencing - guessing the plant and part of the plant.
Elaboration - wheat, wheat plant --> parts --> vegetables --> vegetable parts.

III. PRACTICE:

Distribute *Santillana Primary Level B*, Focus Sheet 9.2, p. 46 to each student. Instruct the students to put an X in the box under the part or the classification of the plant we eat. Give them a time limit, e.g. 3 minutes.

IV. EVALUATION:

When the students have completed the sheet, they compare and correct their answers with a partner.

The teacher corrects the sheet with the class. The students tell the teacher the correct answers, and the teacher puts an X in the appropriate box on the transparency.

[Self-Monitoring]
[Self-Evaluation]
[Imagery]
[Grouping]
[Inferencing]
[Cooperation]
[Questioning]

Self-Monitoring - as they are completing the worksheet.
Self-Evaluation - upon completion.

V. FOLLOW UP:

Distribute a chart to each student. Divide the class into groups and appoint a leader for each group. Place all the cards which were on the chalkboard ledge on their desks.

Roots	Stems	Leaves	Seeds

Strategy Instruction:

[Organizational Planning]--

Ask:

- What do you think you are going to do with the vegetable pictures and the chart? (Write the names of the vegetables under the right part or heading.)

[Grouping]--
[Deduction/Induction]--

- What is this strategy called when we put all the vegetables in the right column under the appropriate plant part or classification? (grouping)
- Where will you find the correct spellings and names of the vegetables? (on the back of the picture cards)
- How will you write the names of the vegetables? Should we write "beet" or "beets"? (beets) Why? (we mean more than one; add "-s" for plural)

Assign a time limit, e.g. 10 minutes.

[Self-Monitoring]

[Imagery]
[Grouping]
[Inferencing]

[Cooperation
[Questioning]

Correct the chart with the class. The teacher asks:

- Who has the beets?
- Hold up the picture.
- Where did you write "beets"? (under "roots")
- How did you spell "beets"? (b-e-e-t-s)
- Why did you write "beets" instead of "beet"? (more than one beet)
- Did you do this with all the vegetables?

[Self-Evaluation]

Do this for each vegetable. This will promote self-confidence as the students have cooperated and been responsible for their own learning as they grouped the vegetables. Encourage the students to give you, the teacher, the answers, show the picture, tell the classification and the spelling. This process will empower them as learners.

Strategy Instruction:

[Grouping]--

- Which is easier to understand, the vegetables all mixed up or the vegetables grouped on the chart like this?
- Why?

[Cooperation]--
[Questioning]--

- Was it easier to do when you worked together and cooperated?
- Why?
- Did you ask each other questions when you worked together?
- Did asking questions help you?
- How?

[Self-Evaluation]--

- Was your chart correct?
- When did you know your chart was correct?
- Did you know before I corrected it with you?
- How? (compared with others)
- Does comparing and discussing your work with someone else's help you to evaluate your own work?

EXTENDED ACTIVITY:

This could be done in the following lesson. Students cut pictures of vegetables from magazines or fliers. They write the classifications of roots, stems, leaves, seeds on a piece of large construction paper.

Roots	**Stems**
Leaves	**Seeds**

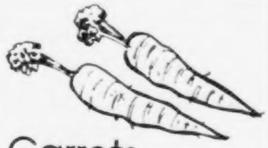
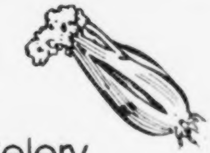
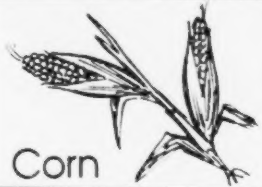
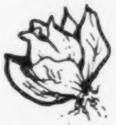
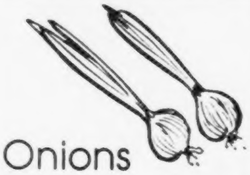
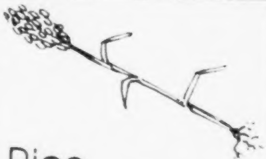
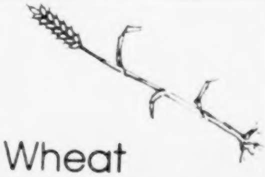
They glue the picture of the vegetable in the proper classification. They print the name of the vegetable in the plural form under each picture (from *Open Sesame, Stage D - Prairie Dawn's Purple Book, Teacher's Book*, page 21).

[Imagery]
[Classification]
[Grouping]
[Elaboration]
[Resourcing]
[Inferencing]

Imagery - pictures of vegetables.
Classification - naming the plant parts as headings.
Grouping - the pictures.
Elaboration - pictures --> naming --> grouping
Resourcing - using magazines and fliers.
Inferencing - guessing where the pictures belong.

FOCUS SHEET 9.2

Name ______________________________

	Roots	Stem	Leaves	Seeds
 Carrots				
 Celery				
 Corn				
 Lettuce				
 Onions				
 Rice				
 Wheat				

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Parts of a Plant

Learning Log - Lesson 5

VOCABULARY I KNOW:

Plant Parts

_____ leaves
_____ roots
_____ seeds
_____ stems

Vegetables

_____ asparagus
_____ beans
_____ beets
_____ brussels sprouts
_____ cabbage
_____ carrots
_____ celery
_____ cooking onions
_____ corn
_____ green onions
_____ lettuce
_____ parsnips
_____ peas
_____ potatoes
_____ radishes
_____ spinach
_____ turnips

LANGUAGE:

I can:

_____ Read and write the names of vegetables.
_____ Write plural forms of vegetables.

CONTENT:

I can:

_____ Identify the 4 parts of a plant.
_____ Identify and name vegetables.
_____ Group vegetables according to the part we eat.

LEARNING STRATEGIES:

I can:

_____ Use pictures to name vegetables.
_____ Group vegetables.
_____ Use magazines to get pictures.
_____ Use what I know to learn more.
_____ Guess names and groups.
_____ Evaluate my own work.

Lesson 6: Plant Problems (Mathematics, Language Arts)

Objectives:

Content Objectives:

- To learn how to read math word problems.
- To learn the vocabulary associated with math word problems and their operations.
- To learn how to distinguish between + and -.
- To learn how to solve math word problems.

Language Objectives:

Skills:

- Listening - to instructions
  - for information
- Speaking - to give information
- Reading - the math word problems
- Writing - equations
  - answers to the problems in complete sentences

Linguistic Knowledge:

Vocabulary Development:

- problems, read, reread, equation, solve, sentence, altogether, in all, add, plus, sum, answer, left, difference, minus, equals

Structures:

- Distinguishing between declarative and interrogative sentences
- Writing declarative sentences
- Subject-verb agreement
- Irregular past tense

Discourse Features:

- Discourse markers
  - first, second, third, fourth, fifth
- Theme - rheme structures
- Coreference markers - personal pronouns

Function:

- Writing declarative sentences derived from the questions.

Learning Strategies:

Metacognitive Strategies:

- Advance Organization
- Selective Attention
- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Inferencing
- Summarizing
- Deduction/Induction
- Imagery
- Elaboration
- Transfer

Social-Affective Strategies:

- Cooperation
- Questioning

Materials:

- Visuals of fruits and vegetables, or the real fruits and vegetables listed in the problems.
- Worksheet of problems (See end of lesson).

Procedures:

I. PREPARATION:

- Distribute the problem worksheet to the class.

Ask:

- What is on the worksheet? (problems)
- How many problems are there? (4)
- What do you think we are going to do? (solve the problems)

[Advance Organization]

II. PRESENTATION:

Introduce and discuss how to do a math word problem. Write the 5 steps on the chalkboard as you discuss them. Write only the first word so the students understand.

1. READ the problem to decide whether to add or subtract. Discuss: key words which indicate the operation e.g. "altogether", "in all" --> +; "left", difference --> -
    - The academic vocabulary
        + --> plus, add
        - --> minus or take away, subtract
        = --> equals

Ask the students to circle the words in all the problems which indicate the operation.

[Selective Attention]

2. REREAD the problem and write down the numbers listed in the problem.

Ask:

- What does REREAD mean? (to read again)
- What did we add to read to make it mean again? (Re)
- What does REDO mean? (do again)
- What does RERUN mean? (run again)
- What is the RE we add add to the beginning of a word called? (a prefix)

3. EQUATION

Write the numbers and operation (+ or -) in an equation with an "=" sign. We do not need an unknown (e.g., = n) as this is a primary class.

[Summarizing]

4. SOLVE the problem by finding the answer.

5. SENTENCE

Write the answer in a complete sentence.

[Organizational Planning]

Model the first problem with the class.

1. Ask a student to READ problem #1.

Ask:

- Do we add or subtract? (add) Write "+" on the chalkboard.
- How did you know we add? (the word "altogether")

Strategy Instruction:

[Selective Attention]--

- When you pay special attention to words in the problem, does it help you decide whether to add or subtract?
- Look at problem #2. What word tells you whether you add or subtract? ("left")
- Do you add or subtract? (subtract)

Do the same questioning with questions #3 and 4.

2. Let's do the second step. Ask a student to REREAD the problem and tell the other students to write the numbers as the student rereads the problem.

   - What numbers did you write down? (2, 3, 5)
   - What do these numbers stand for? (2 kg beets, 3 kg radishes, 5 kg carrots)
   - What part of the plant do all these vegetables come from? (roots)

3. Let's do the third step and write the EQUATION.

   - We have: 2 3 5 +
   - What do we do to these numbers? (add)
   - What symbol is adding? (plus)
   - Where do we write plus? (between the 2, 3, 5)
   - What do we write at the end? (=)
   - Let's read the equation: 2 + 3 + 5 =
   - What do we do now? (find the answer, solve it)

4. Let's do the fourth step.

   - What do we have to do to solve it? (add)
   - Let's add. Do we add all the numbers at once? (no, two at a time)
   - Say 2 + 3 = 5, + 5 = 10
   - What is the answer? (10)
   - Are we finished? (no)
   - What do we have to do next? (write a sentence)

Strategy Instruction:

[Deduction/Induction]--

5. Where will you find the words for your sentence? (in the question)

   - Which sentence is the question? (How many kg of vegetables did she buy?)
   - How do you know this is a question? (question mark)
   - Do all questions or asking sentences end with a question mark? (yes)
   - What are the sentences that end with a period? (telling sentences)

3 3

Ask a student to read the question. Print the question on the chalkboard.

Ask the students to underline the words in the question they are going to use in their answer.

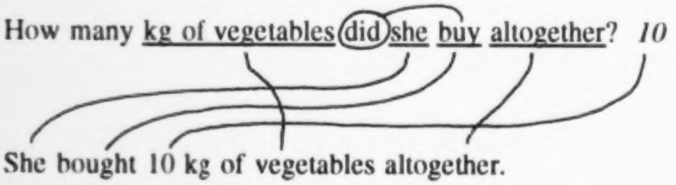
Ask them which words they underlined, and underline them on the chalkboard.

How many kg of vegetables did she buy altogether?

- What is the first word in your sentence? ("she")
- How do you write the first letter in "she"? (capital)
- Why? (first letter in a sentence)
- Why did you write "she" and not "he"? (says "she" in the problem and Lisadel is a girl)
- What is the next word? ("buy")
- Is she buying the vegetables now or did she already buy them? (she already bought them)
- What word tells you she already bought them? ("did")
- What is the past tense for "buy"? (bought)
  Write "bought".
- How many did she buy? (10)
- What does "kg" stand for? (kilograms)

Write "She bought 10 kg" -- of what? (of vegetables altogether)

Write the complete sentence under the question and show the students where the words came from in the question.



How many kg of vegetables did she buy altogether? *10*

She bought 10 kg of vegetables altogether.

Ask:

- How many words are in the telling sentence with the answer? (7)
- How many words did you underline in the question? (6)
- So, 6 out of 7 of the words came from where? (question)
- What was not in the question that you had in your telling sentence? (10)
- What is "10"? (the answer)
- Where is most of the information? (in the question)
- What did "10" answer in the question? (how many)

[Advance Organization]	*[Inferencing]*
[Selective Attention]	*[Summarizing]*
[Organizational Planning]	*[Transfer]*
	[Deduction/Induction]

Inferencing - guessing + or -
- guessing numbers
- guessing the words to use in their sentences.
Summarizing - equation
Transfer - computation skills to problems.

III. PRACTICE

Have the students work with a partner to do the second problem, following the 5 steps listed on the chalkboard. The teacher circulates to give cues or assistance.

[Self-Monitoring]

[Elaboration]

[Cooperation]
[Questioning for Clarification]

IV. EVALUATION:

When the problem has been completed, ask the students to demonstrate how they used each step.

[Self-Evaluation]

V. FOLLOW UP:

The students complete the worksheet of problems with their partners. When it has been completed they correct it together. Upon completion they read it individually to the teacher, who is checking for:

1. correct procedures
2. correct answers
3. correct declarative sentences

[Self-Evaluation]

[Elaboration]

[Cooperation]
[Questioning for Clarification]

Plant Problems

1. Mesbah's mother bought 2 kg of beets, 3 kg of cooking onions, and 5 kg of potatoes. How many kg of vegetables did she buy altogether?

2. Bali had a bag of carrots. He had 8 carrots in the bag. He gave away 5 carrots to his friends. How many carrots did Bali have left?

3. Lisadel had 5 heads of cabbage and 6 heads of lettuce. How many heads did she have in all?

4. Mina bought 12 cobs (1 dozen) of corn. Her family ate 6 cobs of corn for supper. How many cobs of corn were not eaten?

Plant Problems

Learning Log - Lesson 6

VOCABULARY I KNOW:

Problems

_____ equation
_____ read
_____ reread
_____ sentence
_____ solve

Ordinal Numbers

_____ fifth
_____ first
_____ fourth
_____ second
_____ third

Sentences

_____ asking
_____ how many
_____ period
_____ question mark
_____ telling

Addition

_____ add
_____ altogether
_____ answer
_____ in all
_____ plus
_____ sum

Subtraction

_____ difference
_____ equals
_____ left
_____ difference

LANGUAGE:

I can:

_____ Read math word problems.
_____ Tell the difference between a telling sentence and a question.
_____ Write sentences with the answers.
_____ Use the past tense.

CONTENT:

I can:

_____ Solve math word problems.

LEARNING STRATEGIES:

I can:

_____ Look for key words when deciding to add or subtract.
_____ Guess which numbers to use when writing an equation.
_____ Work and cooperate with others to help me learn.
_____ Ask others questions when I need help.

Lesson 7: Celery Experiment (Science)

Objectives:

Content Objectives:

- To understand how water moves through a plant.
- To reinforce the parts of a plant.
- To do and to write a science experiment using the following headings: Materials, Observation, Conclusion and Diagram.

Language Objectives:

Skills:

- Listening - to instructions, during the game and during the experiment.
- Speaking - in the game giving information
    - when working with their partners
- Reading - the science experiment
- Writing - the science experiment

Linguistic Knowledge:

Vocabulary Development:

- materials, observation, conclusion, diagram, beaker, food coloring, celery stalk, drops, turn, change, suck, carry, label

Structures:

- Past tense
- Capitalization
- Punctuation - commas
- Sentence structure

Discourse Features:

- Discourse markers
    - ordinal numbers: first, second, third, fourth, fifth
- Experiment report format

Function:

- To describe and to write parts of a science experiment.

Learning Strategies:

Metacognitive Strategies:

- Selective Attention
- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Imagery
- Elaboration
- Inferencing
- Deduction/Induction
- Transfer
- Grouping

Social-Affective Strategies:

- Cooperation
- Questioning
- Self Talk

Materials:

- Picture cards of vegetables.
- One beaker and two stalks of celery for each student.
- Water
- Pail
- Red and blue food coloring
- Worksheet

Note: The following science experiment is modeled by the teacher and modified to include materials, observation, conclusion and diagram. It is the first science experiment done by the primary class. The ESL teacher should collaborate with classroom teachers to find out which terms or headings they are using.

Procedures:

I. PREPARATION:

Review and write the parts of a plant on the chalkboard - roots, stems, leaves, seeds.

Play the game described in lesson 5 (presentation) using the vegetable picture cards. Orally review the vegetables as they are placed on the chalkboard ledge. A person on one team says the name of a vegetable. The designated person from the other team must:

(1) Identify the correct picture.
(2) Name the part of the plant.

This game is played for 5 minutes to reinforce the names of the vegetables and the parts of the plants we eat.

[Grouping]
[Imagery]

Strategy Instruction:

[Imagery]--

Ask:

- Did the pictures of the vegetables help you to guess which part of the plant you eat?
- How did the picture help you? (helped us remember)

[Grouping]--

Ask:

- How could we have made it easier for you to guess? (group the cards)
- How would you group the cards? (all the roots together, stems together, leaves together and the seeds together)
- Why do you think I mixed the cards all up? (for the game)
- Did I mix them up on purpose? (yes)

With the help of the class, place the cards together according to their classifications.

- Which is easier to remember - how we had the cards in the game or like this?

Show the celery picture card. Show a real stalk of celery. Ask the students to name the parts of the plant, e.g. stem, leaves.

Ask:

- Which part do we eat? (stem)
- What do we call celery stems? (stalks)
- Did the celery stalk have roots? (yes)
- What happened to the roots? (they were cut off)
- Why do you think the roots were cut off?

Draw a diagram of a stalk of celery on the board and label the parts. Ask:

- What is the purpose of the roots?
- What is the purpose of the stem?
- What is the purpose of the leaves?

[Imagery]
[Elaboration]
[Inferencing]
[Classifying and Grouping]

Imagery - using the picture cards.
Elaboration - reinforcing the vegetables and the parts of the plant.
Inferencing - guessing in the game.
Classifying and Grouping - the vegetables according to their parts.

II. PRESENTATION:

Each student is given two stalks of celery and one beaker. They are shown a pail of water and the blue and the red food coloring.

Ask:

- What do you think we are going to do? (a science experiment)

[Organizational Planning] *[Inferencing]*
[Predicting]

- Why did you predict that?
- What are we going to use in this science experiment? (celery, water, beakers, food coloring)

The students probably will not know the words - "beaker" and "food coloring". Discuss these words by asking:

beaker

- What is this container made of? (glass)
- Why is it made of glass? (to see things as they are measured)
- What does it look like? (a measuring cup)
- How is it the same as a measuring cup? (glass, spout, and it measures things)
- How is it different than a measuring cup? (no handle and the shape)
- How are the shapes different?
- When do you use a measuring cup? (baking, cooking)
- When do you use this? (science experiment)
- What is this spout shaped like? (a bird's beak)
- It is called BEAKER.

food coloring

- What is in these little containers? (food coloring)
- Have you ever seen food coloring before? When?
- What will happen if they are added to water? (change the color)

- What color will the water change to if I add the red food coloring? (red)
- What color will the water change to if I add the blue food coloring? (blue)

Print all the materials on the chalkboard. Ask them what has to be put between the words to separate them. (commas)

- Celery, beakers, water, food coloring

Ask:

- What is this science experiment going to be about? (celery)
- What should we write for the title of the experiment? (Celery Experiment). Print this at the top of the chalkboard.

Celery Experiment

- Why are there capital letters on the words "Celery" and "Experiment"? (title)

Give each student the worksheet, to copy in the title. Refer to the list of materials.

Ask:

- What are these? (things we use in the experiment)
- What is the word for the things we use? (materials)

Print "Materials" on the chalkboard.

- What kind of letter does "Materials" start with? (capital letter)
- Why? (heading)

[Deduction/Induction]

- What is printed in the brackets after "materials"? (what we used)
- Print the "materials" we will be using on your papers.

Assign partners for the experiment. They are instructed to check the materials they have - 4 stalks of celery and 2 beakers.

Refer them to the instructions or method written on the chalkboard.

Method

1. Tape your names on each beaker.
2. Fill each beaker 2/3 full of water.
3. Add 6 drops of red food coloring to one beaker. Add 6 drops of blue food coloring to the other beaker.
4. Place a stalk of your celery in each beaker.
5. Put the beakers on the window ledge.

Ask:

- How many steps are we going to do in this experiment? (5)
- How do you know? (there are 5 numbers)
- What do we do first? (tape our names on our beakers).
- Do it.
- What do we do second? (fill each beaker 2/3 full of water)
- Do it.
- What do we do third? (Add 6 drops of red food coloring to one beaker. Add 6 drops of blue food coloring to the other beaker.)
- Do it.
- What do we do fourth? (Place a stalk of celery in each beaker.)
- Do it.
- What do we do fifth? (put the beakers on the window ledge.)
- Do it.
- What did we do? (a science experiment)
- What part of the science experiment? (method)
- Where do you see that word? (on the board above what we did)
- What do you think is going to happen to the celery? (listen to their predictions and write them on the board for the next lesson)

This is their first science experiment; therefore, they will not write the hypothesis or the method. These procedures will be elaborated upon in a subsequent lesson (10) later in the unit.

[Organizational Planning]
[Selective Attention]
[Self-Monitoring]

[Predicting]
[Inferencing]
[Deduction/Induction]
[Imagery]

[Cooperation]
[Questioning]
[Self-Talk]

Organizational Planning - what to do.
Selective Attention - reading key words before doing the experiment
Self-Monitoring - what they are doing.
Predicting - what will happen.
Inferencing - when giving answers.
Deduction/Induction - when writing.
Imagery - doing the experiment.
Cooperation - when working together.
Questioning - each other when doing the experiment.
Self Talk - telling themselves the instructions or method as they do it.

III, IV. PRACTICE AND EVALUATION:

The next day the students take their beakers to their desks to work with their partners. They discuss what happened with their partners. Write on the chalkboard.

(What we saw happen)

(What we learned)

Ask:

- What happened? (The leaves in the red water turned red and the leaves in the blue water turned blue.)
- How do you think this happened? (from the water)
- How did the colored water get up to the leaves? (up the stem)

Refer the students to the chalkboard and distribute their worksheets to complete the writing of the experiment.

- Do you know the scientific name for what we saw happen? (observation)
- Where do you see that written? (on the paper). Write "Observation" on the board before the brackets.
- What kind of letter does "Observation" start with? (capital letter)
- Why? (heading)
- What is the root word or what word do you see in "Observation"? (observe)
- What does "observe" mean? (to see)
- Do you think that is why it is called an observation?
- What did you observe in this experiment?

[Deduction/Induction]

Summarize their replies on the chalkboard to provide the key words for them to create their own sentences.

The ______ turned _______ _____ _____ _________ _________ and

___ ______ ______ _______ _____ _____ _________ _________

e.g. The leaves turned red in the red water and

the leaves turned blue in the blue water.

- How will you write your observations?
- What will you say?
- Where will you find the spelling of the word "water"? (under materials)
- Where will you find how to spell the colors? (know it or from the color chart on the wall)
- If you do not know how to spell a word, what will you do? (sound it out and guess)
- When did the leaves change or turn a different color? (yesterday)
- What do you have to add to "turn" or "change" if it happened yesterday? (ed)
- This is in the past and is the past tense.
- Work with your partner and write your sentences together.
- What do you have to remember to put at the beginning and at the end of your sentences? (capital letters and periods)

[Deduction/Induction]

The teacher circulates to assist the students when needed. When they have completed writing their observations, follow the same procedure with the "Conclusion" (What we learned.)

e.g. The (celery) (sucked) (the) (water) up (the) (stem) to (the) (leaves).

[Self-Monitoring]
[Self-Evaluation]

[Imagery]
[Elaboration]
[Deduction/Induction]
[Transfer]
[Inferencing]

[Cooperation]
[Questioning]

Self-Monitoring - as they are writing.
Self-Evaluation - when completed.
Imagery - looking at the real materials to help them write.
Elaboration - relating what they saw happen in the experiment to the written form.
Deduction/Induction - when writing the sentences.
Transfer - the concrete --> abstract (words)
Inferencing - to complete the sentences.
Cooperation - with their partners.
Questioning - each other when working with their partner.

Strategy Instruction:

When the students have completed writing their observations and conclusions, ask:

[Self-Evaluation]--

- How did you do?
- Do you understand how water moves through a plant?

[Imagery]--

- What helped you to understand? (doing the experiment)
- How did doing the experiment help you? (can see the leaves change color)
- When you actually see it happen, is it easier to understand and remember?

[Elaboration]--
[Transfer]--

- Do you understand the parts of an experiment - materials, observation and conclusion?
- Did actually doing the experiment help you to understand how to write it?

[Cooperation]--
[Questioning]--

- When you worked together and talked about your observations and conclusions, did that make it easier to write them?

V. FOLLOW UP:

Distribute blank papers to the students. Write on the chalkboard:

DIAGRAM (What it looked like)

Ask:

- What is a diagram? (picture)
- What will we draw in the diagram? (the celery in the beakers of colored water)
- What color will the leaves be? (the same color as the colored water)
- Why don't we just call this drawing a picture? (the science name is "diagram")
- What do you have to remember to include in your diagrams? (2 beakers, red water, blue water, celery)
- Write these words on the board as a reminder to the students. Remind them to look at the actual experiment on their desks as they draw their diagrams.

As they are completing their diagrams, ask:

- What will the title of the diagram be? (Celery Experiment Diagram)
- What do you have to remember to put on the first letters? (Capital letters)
- Why? (title)

Point to the beaker and ask:

- What is this? (beaker)
- You have to LABEL your diagram. Show the students how to label their diagrams. Tell them to label the rest of the diagram.

[Imagery]
[Transfer] (the picture to paper)

When the students have completed their experiments they show it to their teacher who will help them edit.

The students read their final drafts to the teacher.

Experiment Format

(Title) ______________________________________

Materials (What we used.)

Observation (What we saw happen.)

Conclusion (What we learned.)

Diagram (What it looked like)

Celery Experiment

Learning Log - Lesson 7

VOCABULARY I KNOW:

Experiment

_____ conclusion
_____ diagram
_____ materials
_____ observation
_____ title

Materials

_____ beaker
_____ celery stalk
_____ drops
_____ food coloring
_____ water

Verbs

_____ carry
_____ change
_____ label
_____ suck
_____ turn

CONTENT:

I can:

_____ Do a science experiment
_____ Understand how water moves through a plant.

LANGUAGE:

I can:

_____ Write a science experiment.
_____ Can write sentences without using "I" or "we".
_____ Can write in the past verb tense.
_____ Read my science experiment.

LEARNING STRATEGIES:

I can:

_____ Predict what will happen.
_____ Do the experiment to help me understand what happened.
_____ Work with others to do the experiment.
_____ Ask others questions when doing the experiment.
_____ Tell myself what to do as I do it.

Lesson 8: Johnny Appleseed (Language Arts)

This lesson was chosen because it follows a logical progression from foods that grow on plants (previous lessons) to foods that grow on trees. This progression was listed in the unit "Plant Power" in Santillana, *Bridge to Communication, Primary Level B*. The story of Johnny Appleseed in *Addison-Wesley ESL, Level B* was used. It is unfortunate that this is an American folktale, but a comparable Canadian folktale could not be found. The American content was downplayed. The language content and learning strategies were emphasized.

This story is a wonderful story and is more difficult to read than "The Little Red Hen" because it does not feature the same kind of episodic repetition. The excellent visuals and the manipulation of the content will assist both the comprehension and the reading. This story was chosen to assist the students through their zone of proximal development (ZPD - Vygotsky) to a higher level of competence.

Objectives:

Content Objectives:

- To introduce a biography.
- To introduce foods that grow on trees.
- To read the story and answer the questions.

Language Objectives:

Skills:

- Listening - for information
  - to note-take
- Speaking - to give information
  - to correct and verify answers
- Reading - the story for specific information for the answers
- Writing - complete declarative sentences

Linguistic Knowledge:

Vocabulary Development:

- Newton apples, MacIntosh apples, Spartan apples, Golden Delicious apples, crab apples, raw, cooked, baked, apple sauce, apple crisp, apple pie, apple turnovers, apple tarts, skin, food, core, seeds, stored food, sprout, presents, stick, outdoors, woods, forest, pine trees, fields, mountains, resting, journey, north, south, east, west, country, suspenders, fox, deer, chipmunk, rabbit, squirrel, crane, frog, turtle, opossum, woodpecker, lily pads, bull rushes

Structures:

- Past tense

- Capitalization
- Punctuation

Discourse Features:

- Theme - rheme structures

Functions:

- Answering "wh" questions by writing declarative sentences, using the words in the questions.

Learning Strategies:

Metacognitive Strategies:

- Advance Organization
- Selective Attention
- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Prediction
- Inferencing
- Imagery
- Note Taking
- Auditory Representation
- Resourcing
- Deduction/Induction

Social-Affective Strategies:

- Cooperation
- Asking questions for clarification

Materials:

- Knife
- Apples (different types e.g. Golden Delicious, MacIntosh, Newton, Spartan)
- Story of Johnny Appleseed (*Addison-Wesley ESL, Level B, Student Book*, pp. 72-75; **see end of lesson**).
- Worksheet (questions about the story; **see end of lesson**.)

The general procedure of the Text Questioning Technique (described in Chapter 3) was followed in this lesson.

Procedures:

I. PREPARATION:

A. Brainstorming about apples.

This activity was suggested in *Addison-Wesley ESL, Level B, Teacher's Edition*, p. 153).

Bring various apples to class and ask:

- What are the colors of apples? (red, green, yellow)
- What kind of apples are there? (MacIntosh, Spartan, Newton, Golden Delicious, crab)
- Where do apples grow? (on trees)
- Do any of you have apple trees?
- How do we eat apples? (raw, cooked, baked)
- When you cook apples, what can you make? (apple sauce, apple crisp, etc.)
- When you bake apples, what can you make? (apple pie, apple turnovers, apple tarts, etc.) This is prior knowledge from their bakery activity in Lesson 4.
- Can you name the parts of an apple? (skin, food, core, seeds)
- Where is the skin? (on the outside)
- Where is the food? (under the skin)
- Where is the core? (inside the apple)
- What is inside the apple core? (apple seeds)
- If you planted these seeds, what would grow? (an apple tree)
- What color are the apple seeds? (brown)
- How many seeds are there in one apple?

Cut an apple into slices. Discuss the parts and count the seeds. The students may eat the slices of the different apples. Predict how many seeds are in the other apples.

- Do you think all apples have the same number of seeds?
- Cut the apples open and count. Was your prediction right?
- Let's look at the apple seeds. (This activity was taken from Santillana *Bridge to Communication, Primary Level B, Teacher's Book*, p. 224).
- What is the brown outside of the seed called? (coat)
- Why do you think it is called the coat? (It protects the seed)
- What color is the inside of the seed? (white)
- What do you think that white stuff is? (stored food)
- What is stored food? (something which can be used for food later on)
- Can you peel the skin off your apple seed?
- Look at the stored food. Is there anything else on the inside? (a little sprout)
- What does "sprout" mean? (grow)
- Where will it grow if you plant the seed? (up)
- What part of the plant will it be? (the stem)

B. Follow the Introductory lesson plan (Text Questioning Technique). Brainstorming about story:

1. Tell the students to OPEN their books to pages 72-75 (*Addison-Wesley ESL, Level B*). Tell them they have two minutes to look at the title and the pictures to guess or predict what they think the story is about.

[Advance Organization]	*[Prediction]* *[Inferencing]*

Advance Organization - skimming the text for the organizing principle.
Inferencing - using the pictures for their predictions.

2. After two minutes, tell the students to CLOSE their books and to write down, in a few words, what they think the story is about. Spelling and sentence structure are not important at this time.

3. Listen to each student's prediction, writing the key vocabulary items on the chalkboard, e.g.,apples, man, trees, animals, presents, seeds, people.

4. Tell the students to OPEN their books and discuss the title and pictures. Ask questions to elicit more vocabulary. Write the vocabulary on the board to aid students when they are note-taking during the presentation phase. They should develop an understanding of the complete story through this brainstorming session, before they read it. This is "setting them up for success."

   e.g. Look at page 72:

   - What is the title? (Presents for America)
   - I wonder what the presents are?
   - What do you think they are?

   Look at the top picture on page 72:

   - What do you see? (a man in a forest, animals)
   - Does this man look rich? (no)
   - How do you know? (no shoes, old ragged clothes)
   - What is he wearing? (shirt, old pants, hat and suspenders)
   - Why is he holding a stick? (to walk)
   - Where is he? (pine trees in the forest)
   - Who is he petting? (a deer)
   - Does the deer like him? (yes)
   - How do you know? (It is licking him.)
   - Is he kind or mean? (kind)
   - Are the animals afraid of him? (no)
   - Why not? (He seems kind and friendly.)
   - Can you name all the animals in this forest? (deer, squirrel, chipmunk, fox, turtle, rabbit, opossum, crane, frog, woodpecker)

- Where are the animals? (incidentally and briefly introduce prepositions when discussing where the animals are. e.g. The fox is *behind* the tree. The chipmunk is *on* the rock, etc.)
- Do you think this man likes the outdoors? (yes)

Look at the picture at the bottom of page 72:

- Where is the man now? (sitting resting under an apple tree)
- What is he doing? (eating an apple)
- Do you think he likes apples? (yes)
- Is he in a hurry? (no)
- Who is watching him? (a rabbit)
- Is the rabbit frightened? (no)
- Is the man young or old? (young)
- When do you think this story took place? (long ago) Why?

Look at page 73:

- What is the man doing? (planting seeds)
- What kind of seeds is he planting? (apple)
- Where does he keep the seeds? (in a handkerchief)
- Where is he? (in the woods)
- What do you think he uses the stick for? (to plant the seeds)
- Do you think he is planting a few trees or a lot of trees? (a lot)

Look at the picture on the top of page 74:

- What is this man doing? (walking)
- Where do you think he is walking?
- Does he look like he is in a hurry? (no)
- Do you think he is going for a long walk or a short walk? (a long walk)
- What is a long trip called? (journey)
- Look at the country, what do you see? (pine trees, field, red flowers, roads, mountains, a house, sun, river, etc.)
- Do you think that house might be his?
- What do you think is in his backpack?

Look at the picture at the bottom of page 74:

- What is the man doing? (planting seeds)
- Has he planted a lot of trees? (yes)
- How do you know? (can see 8 trees in the picture)
- What kind of trees are they? (apple)
- What kind of seeds are they? (apple)
- What was in his backpack? (apple seeds)
- Is he still the same age? (no)
- Do you think he has been planting apple seeds for a while? (yes)
- How do you know? (The trees are different sizes.)

- Do you think he likes planting apple seeds? (yes) Why? (He comes back to plant more trees.)
- Do you think he planted apple seeds just here or everywhere? (everywhere)

Look at the picture at the top of page 75:

- What is this man doing? (giving away apple seeds)
- How many people are in this picture? (6)
- Can you name them?
- What is this man giving to the people? (apple seeds)
- Do the people want his apple seeds? (yes)
- Do the people like this man? (yes)
- Since this man gives away appleseeds, what do you think would be a good name for him? (Johnny Appleseed)

Look at the picture at the bottom of page 75:

- What do you see? (a boy and a girl)
- What are the boy and girl doing? (eating apples)
- Where is the man? (died)
- Do you think this is long ago? (no - it is now)
- What did the boy and girl fill? (a basket of apples)
- Where did they pick all these apples? (from the tree)
- Is this an old apple tree or a young apple tree? (old apple tree)
- How do you know? (the trunk is big and there are lots of apples)
- Who do you think planted this tree? (the man, Johnny Appleseed)
- When you read a story about a person's life, what is it called? (a biography)
- Do you think this story will be a biography about this man? (yes)
- Have you ever read any other biographies?
- Who did you read biographies about?
- Let's look back at the title on page 72. What are the presents that this man gave to his country? (apple trees)

[Selective Attention]
[Advance Organization]

[Inferencing/Predicting]
[Imagery]
[Resourcing]

Selective Attention - to special words.
Advance Organization - of the story before they read it.
Inferencing/Predicting - answers to the question/what will happen next.
Imagery - using the pictures to inference and predict.
Resourcing - using the textbook as a resource to understand the story.

Strategy Instruction:

[Inferencing/Predicting]--

- What do you think the story is about?
- Were your guesses right?

[Imagery]--

- Do you think looking at the title and pictures helps you to guess what the story is going to be about?
- When you have a story to read, do you think it would help you to quickly look at the title and pictures before you read?
- Why?

II. PRESENTATION: Listening

5. The students read the questions on the chalkboard or transparency to themselves. The teacher reads the questions one by one, reviewing any vocabulary the students do not know.

6. The students number a piece of paper numbers 1-8 in preparation for note-taking.

Strategy Instruction:

[Organizational Planning]-- *[Note-Taking]--*

- Why did you number your paper #1-8? (8 questions)
- When you take notes do you write complete sentences? (no)
- What do you write? (the answers)
- Is spelling important when you note-take? (no)
- Where will you find a lot of the words? (on the board)
- Let's look through the questions again and underline key words you will be paying special attention to or listening for.

[Selective Attention]-- (of key words)

1. love
2. kind of seeds
3. walk
4. plant seeds
5. give
6. call him
7. see today
8. presents

- What will follow these key words? (the answers)

7. CLOSE your books. The teacher reads the story slowly. The students listen carefully for the answers to the questions.
8. Read the story again, more rapidly, and a third time (if necessary) to ensure the students have answered most the questions.

[Selective Attention] *[Note-Taking]*
[Self-Monitoring] *[Auditory Representation]*

Selective Attention - for key words.
Self-Monitoring - as they are note-taking.
Note Taking - writing the answers to the questions.
Auditory Representation - playing back the answers in their minds as they write them down during note-taking.

Strategy Instruction:

[Self-Monitoring]--

- How did you do?
- Do you have most of the answers?
- Did you have most of the answers after: the first reading? the second reading? or the third reading?

[Selective Attention]--

[Note-Taking]--
[Auditory Representation]--

- When you were note-taking, what were you listening for? (special words)
- Did listening for special words help you remember the story? (yes)
- When you heard the special word, what did you do in your head as you wrote it down? (said it to myself)
- Did repeating it to yourself help you remember it? (yes)

[Prediction]--

- Were your predictions about the story correct?

III. PRACTICE - Speaking and Reading

9. Assign partners. Students OPEN their books and compare and correct together using their books to verify:

    1) Answers
    2) Spelling

    They are given 10 minutes to complete the task.

[Self-Evaluation]

[Questioning for Clarification]
[Cooperation]
(when working together)

Strategy Instruction:

[Self-Evaluation] - *[Cooperation]*--
[Questioning]--

Ask:

- How did you do?
- Did cooperating or working together help you learn?
- What did you do when you compared your answers? (asked each other questions)

IV. EVALUATION - Speaking

10. CLOSE the books. The students give the teacher the correct answers and the teacher writes the answers beside the question in a different color (chalk or felt pen).

V. FOLLOW UP - Writing

11. Books remain CLOSED. The teacher gives the students a worksheet of questions. The students complete the worksheet, writing the answers in complete sentences.

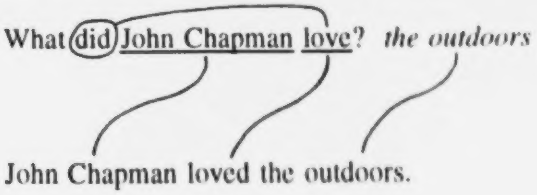
    e.g. What did John Chapman love? *the outdoors*

    - The teacher demonstrates how to write a proper declarative sentence by using:

        a) most of the words in the question
        b) the answers

    - Underline the words in the question that they will use in their answers by asking:

        - What words will we use from the question in our answer?



What did John Chapman love? *the outdoors*

John Chapman loved the outdoors.

Ask:

- How would you write this in a sentence?
- What would your first words be? (John Chapman)
- What do you have to put on the first letters? (capital letters) Why? (first words; and they are his name)
- What would your next word be ? (loved)

- Is it now or was it long ago? (long ago)
- How do you know?
- When you see "DID" in a sentence does that mean now or in the past? (in the past)
- What do you have to add to "love" to make it past tense? (ed)
- If it ends in "e" what do you do? (drop "e" and add "ed")
- What are the rest of the words in the sentence? (the outdoors)
- How many words are in your answers? (5)
- How many of the words came from the question? (3)
- How many of the words came from the answer? (2)

Ask them to complete the sheet of questions.

[Deduction/Induction]
(when writing their answers in complete sentences)

Circulate to assist individual students by providing the necessary cues as they are needed.

12. They edit and read their worksheet to their partner.

[Self-Evaluation] *[Cooperation]*

13. The final draft is presented and read to the teacher.

[Self-Evaluation]

Johnny Appleseed

1. What did John Chapman love?

____

____

2. What kind of seeds did he plant?

____

____

3. Where did he walk?

____

____

4. Where did he plant apple seeds?

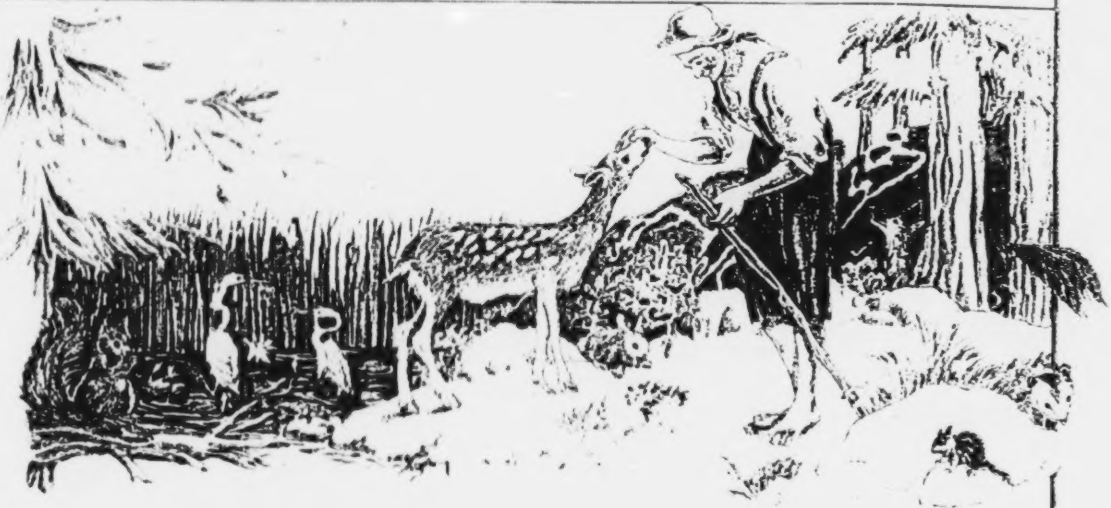
5. Who did he give apple seeds to?

6. What did everyone call him?

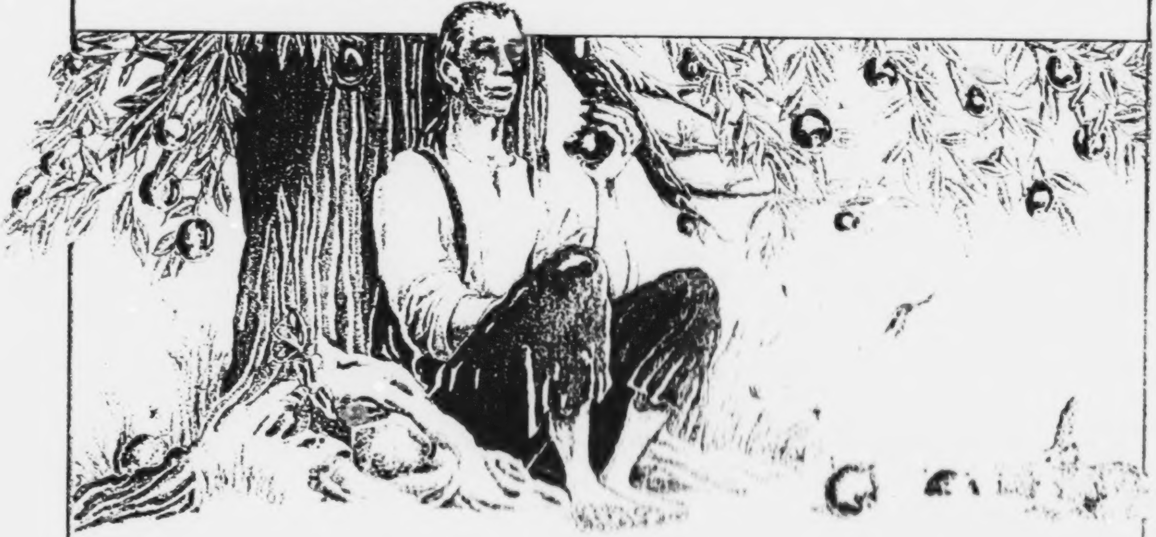
7. What can we still see today?

8. What presents did he give us?

Presents for America



Long ago, a man named John Chapman lived in the state of Massachusetts. He loved the outdoors.



One day, he was walking in the woods. He stopped to rest and to eat an apple. Afterwards, he looked at the apple seeds in his hand.

from *Addison-Wesley ESL, Level B, Student Book*, pp. 72-75

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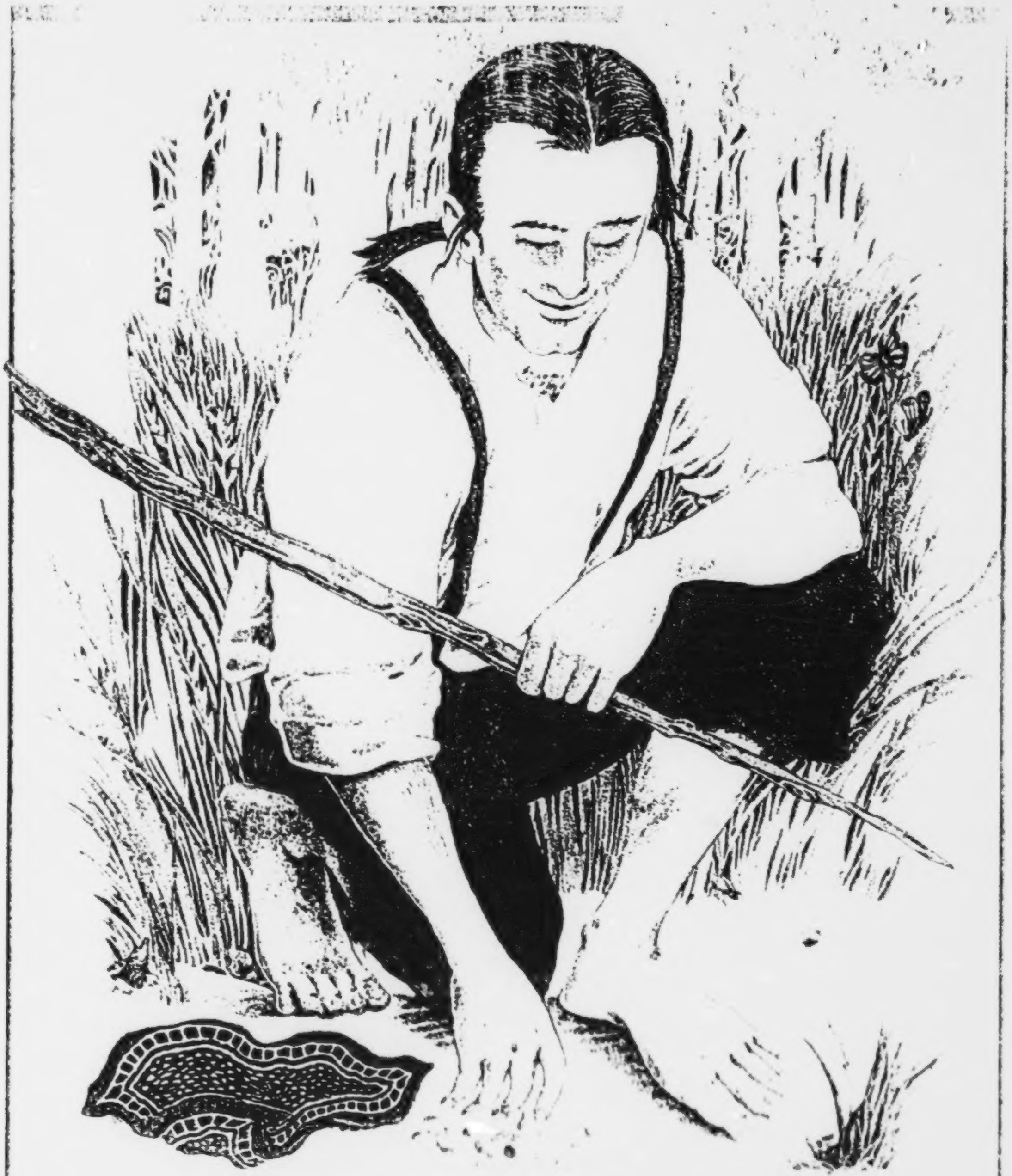
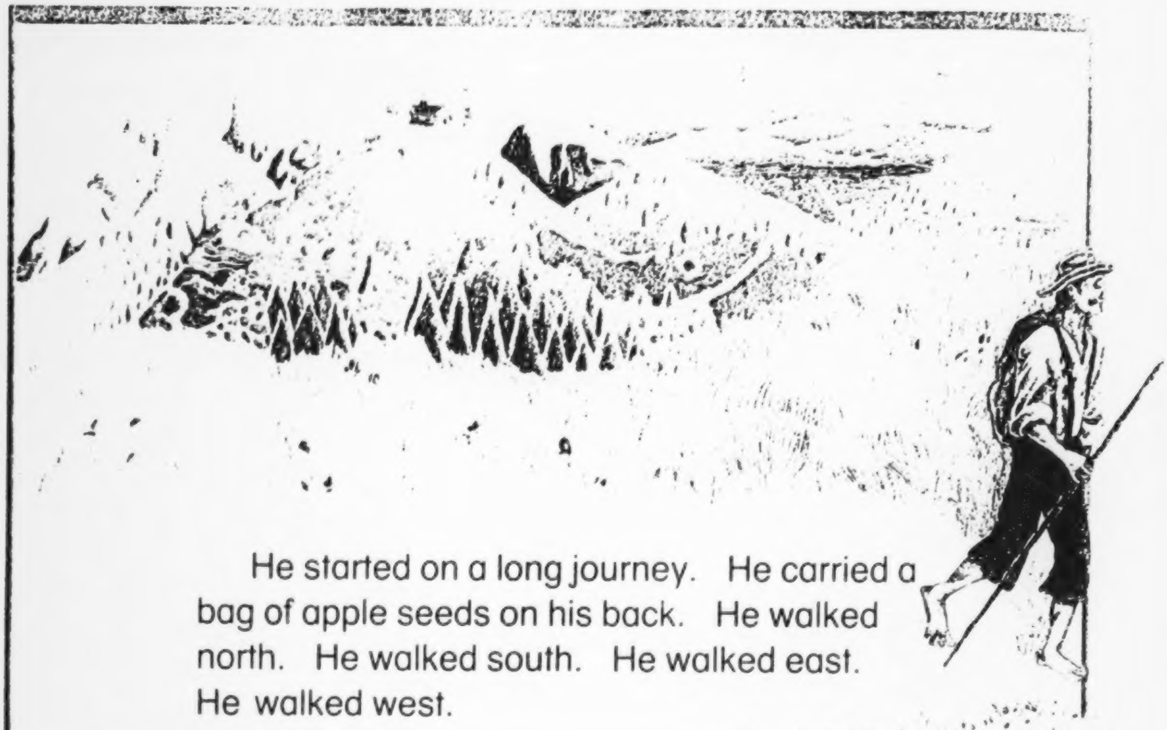
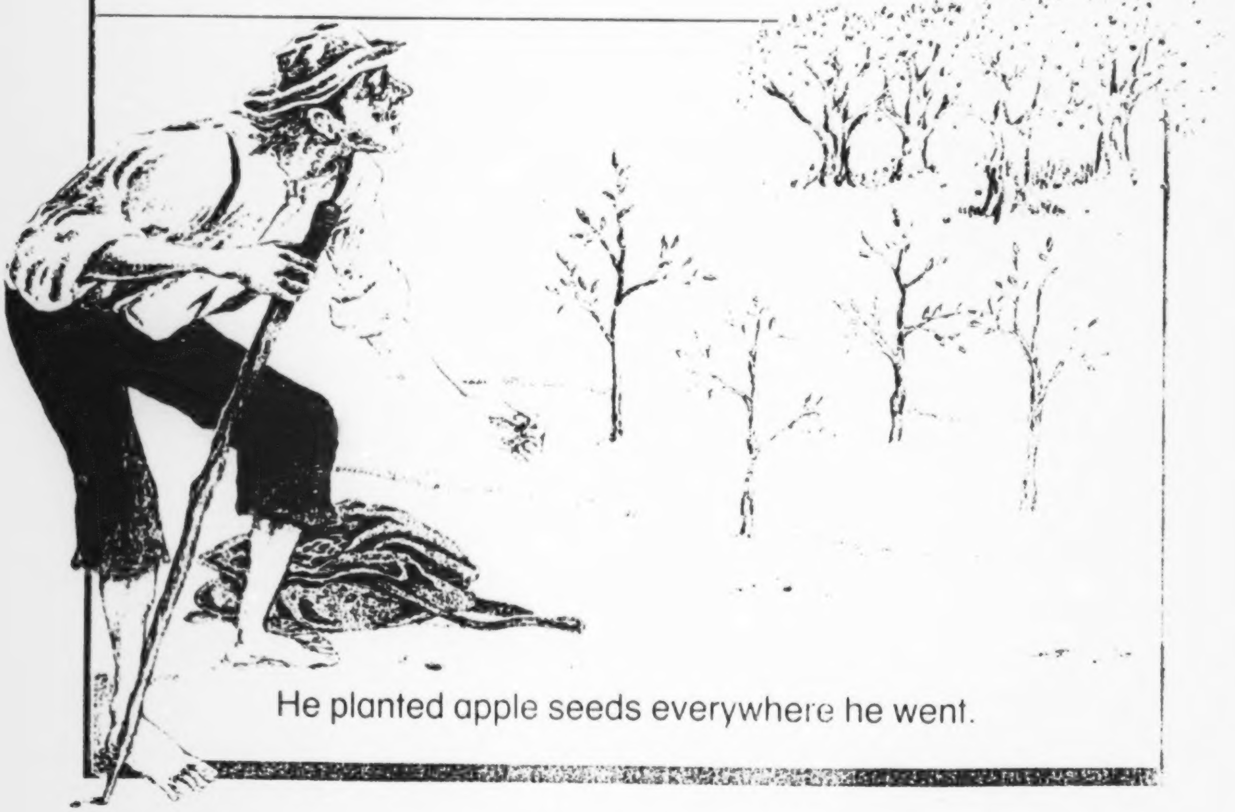


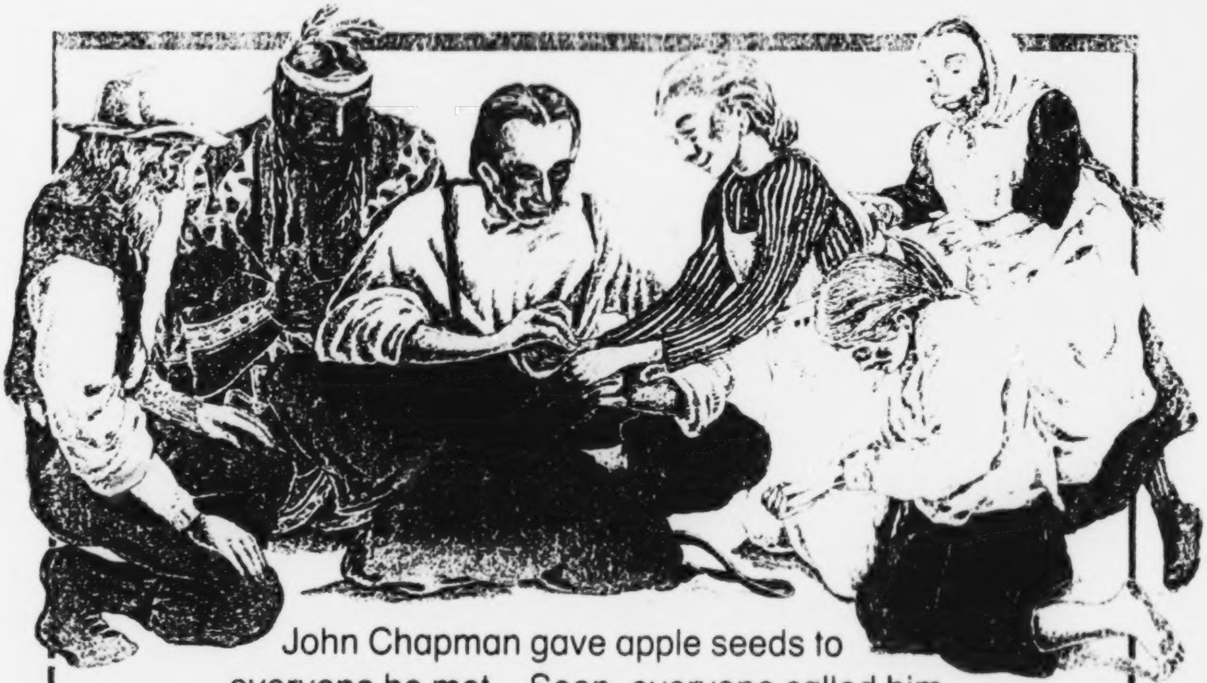
"I'm going to plant these seeds," he said to himself. "I'm going to plant many, many seeds all over America. Our land will soon be filled with apple trees." And that is just what he did.



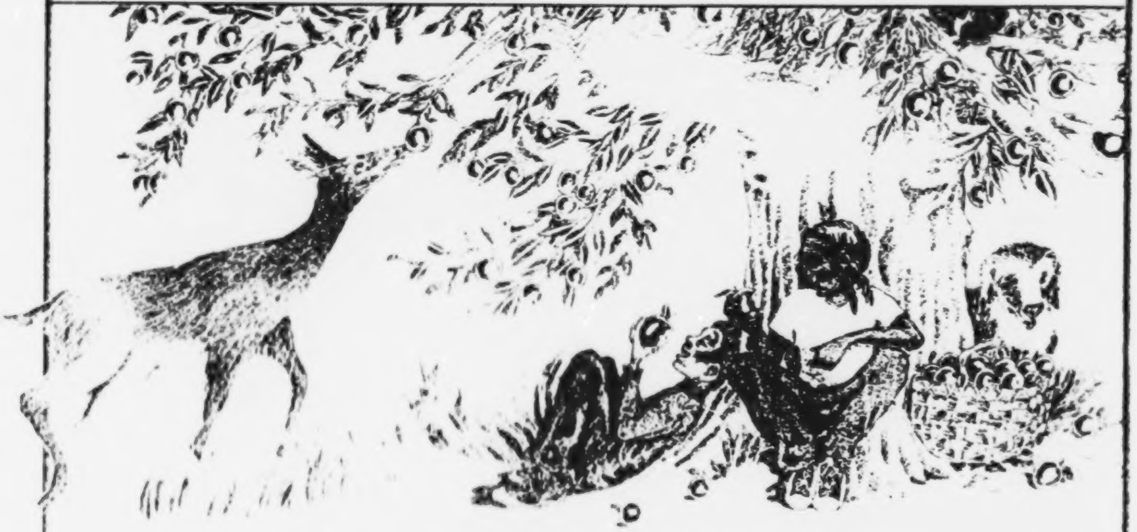
He started on a long journey. He carried a bag of apple seeds on his back. He walked north. He walked south. He walked east. He walked west.



He planted apple seeds everywhere he went.



John Chapman gave apple seeds to everyone he met. Soon, everyone called him Johnny Appleseed.



Today, we can still see some of the trees that Johnny Appleseed planted. They are large, old trees filled with apples. They are the presents he gave to his country.

Lesson 9: The Path of an Apple Seed (Science)

Objectives:

Content Objectives:

- To identify the path of an apple from a seed to a food.

Language Objectives:

Skills:

- Listening - for information
- Speaking - to give information
- Reading - words
- Writing - a word to describe each picture

Linguistic Knowledge:

Vocabulary Development:

- apple tree, plant, seed, blossoms, deliver, pick, buy, eat, pack, store, truck, ladder, boxes

Discourse Features:

- Discourse markers: ordinal numbers

Function:

- Sequencing pictures and words

Learning Strategies:

Metacognitive Strategies:

- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Inferencing
- Imagery

Social-Affective Strategies:

- Cooperation
- Asking questions for clarification

Materials:

- Activity sheet from *Addison-Wesley ESL, Level B, Activity Book*, p. 52.

Procedures:

I. PREPARATION:

Review the story and events of Johhn Appleseed.

II. PRESENTATION:

Distribute the activity sheet from page 52 of *Addison-Wesley ESL, Level B, Activity Book*.

Ask:

- What are these pictures of? (apples)
- Are they in the proper order? (no)
- What do you think you are going to do on this sheet? (put the pictures in the right order)
- How? (write numbers in the boxes)
- What will the first picture be? (the seed)
- What number will you write in that box? (number 1)

[Organizational Planning]

[Inferencing]

III. PRACTICE:

The students work individually and are instructed to sequence the rest of the pictures.

[Self-Monitoring]

[Inferencing]
(guessing the sequence)
[Imagery]
(using the pictures to sequence)

IV. EVALUATION:

The students are assigned to a partner and are to compare the sequential order on their worksheets.

[Self-Evaluation]

[Cooperation]

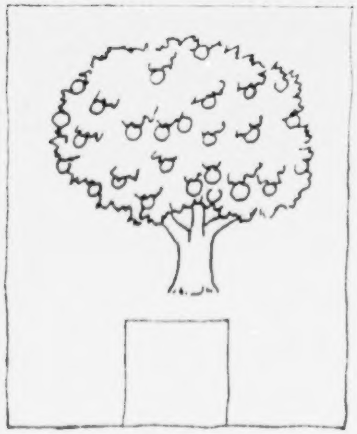
V. FOLLOW UP:

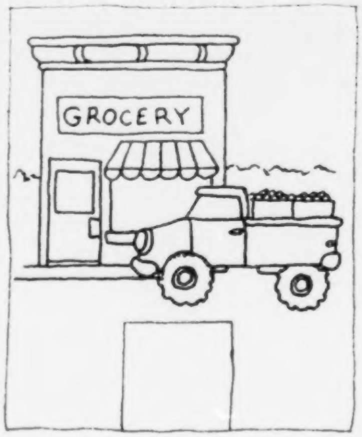
Correct the sequential order with the class by discussing and writing a word to describe each picture. E.g.,

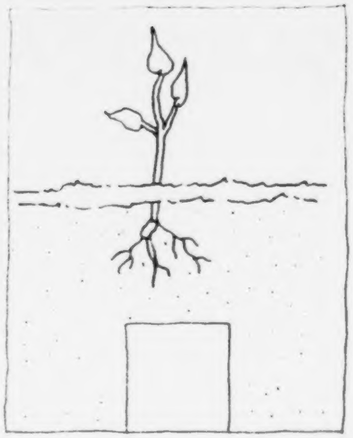
1.seed
2.plant
3.blossoms
4.apples
5.pick
6.pack
7.deliver
8.buy
9.eat

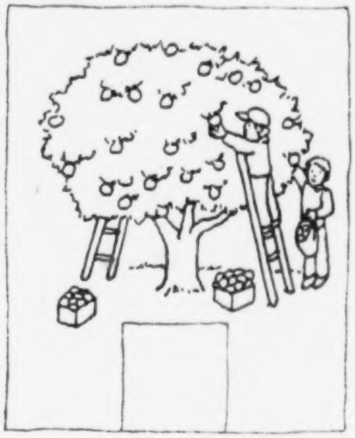
The students write the appropriate word in the appropriate picture. The students cut the pictures and glue them onto a paper in sequential order. The final draft is read to their partner and then to the teacher.

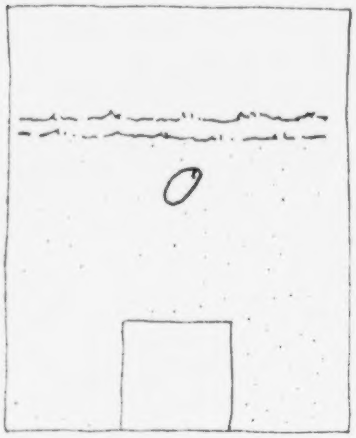
from *Addison-Wesley ESL, Level B, Activity Book*, p. 52

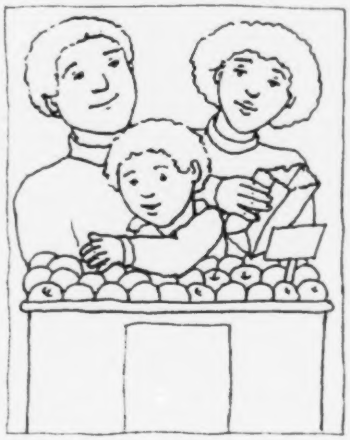


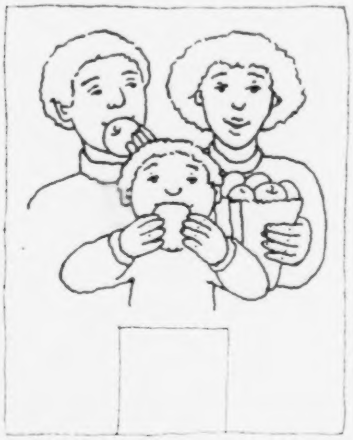


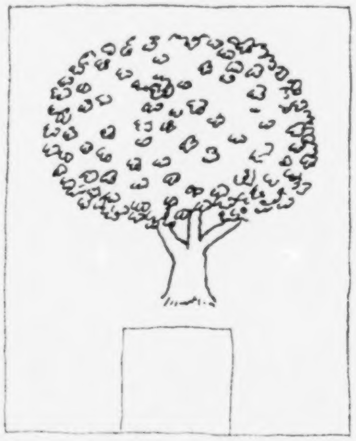


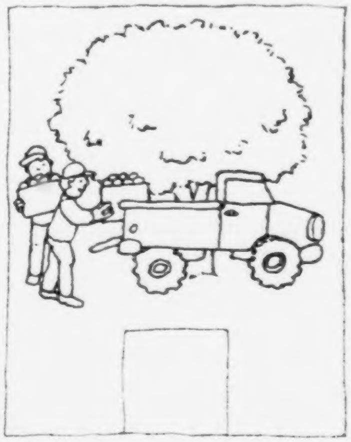












(After Level B, student pages 72–75) **Identifying and describing a sequence.** Students identify each stage of the apple chain and number the pictures accordingly. Encourage free oral description of the stages after completion

Johnny Appleseed and the Path of an Apple Seed

Learning Log - Lessons 8 and 9

VOCABULARY I KNOW:

Apple words

_____ apple crisp
_____ apple pie
_____ apple sauce
_____ apple tart
_____ apple trees
_____ apple turnovers
_____ baked
_____ blossoms
_____ coat
_____ cooked
_____ crab apples
_____ food
_____ Golden Delicious
_____ MacIntosh
_____ Newton
_____ raw
_____ seeds
_____ skin
_____ Spartan
_____ sprout
_____ stored food

Verbs

_____ buy
_____ deliver
_____ eat
_____ pack
_____ pick
_____ plant
_____ rest

Animals

_____ chipmunk
_____ crane
_____ deer
_____ fox
_____ frog
_____ opossum
_____ rabbit
_____ squirrel
_____ turtle
_____ woodpeckers

Nouns

_____ boxes
_____ country
_____ east
_____ fields
_____ forest
_____ journey
_____ ladder
_____ mountains
_____ north
_____ outdoors
_____ pine trees
_____ presents
_____ south
_____ truck
_____ stick
_____ store
_____ suspenders
_____ west
_____ woods

LANGUAGE:

I can:

_____ Listen for information.
_____ Read the questions.
_____ Read the story.
_____ Read the sentences.
_____ Write sentences.
_____ Use the past verb tense.
_____ Write words to describe pictures.

CONTENT:

I can:

_____ Explain what a biography is.
_____ Sequence the path of an apple from a seed to a food.

LEARNING STRATEGIES:

I can:

_____ Use pictures to help me guess.
_____ Predict
_____ Take notes
_____ Listen for special words.
_____ Cooperate with others.
_____ Ask others questions.

Lesson 10: Bean Experiment (Science)

This experiment was selected because it will elaborate upon the students' prior knowledge from the celery experiment to assist them through their zone of proximal development to a higher level of competence. This experiment will include materials, method, observation, conclusion and diagram. It is more complex and will require several days of observation for completion.

The method of this experiment will be given orally to encourage the students to actively listen. The teacher will also demonstrate the procedure as the oral directions are given, in order to provide the necessary oral and visual support.

If this or any other experiment were done with older students, the headings would also include "Hypothesis". These headings are the terms being used in their classrooms. The hypothesis would integrate instruction of the future verb tense. The "Method" would follow the general procedure of the Dictated Instructions Technique (based on an idea in Chamot & O'Malley, 1986) described in Chapter 3. The teacher would simply list the numbers 1, 2, 3, 4 on the chalkboard and tell the students to prepare for note taking. The students are asked how many steps there are in the "Method". They will know when the first one is being dictated because the teacher will provide the discourse markers of ordinal numbers - first, second, third and fourth to provide cues for the note taking task. The instructions are dictated twice using the imperative verb form, to ensure the succcess of the students. The students work together in pairs or groups to compare their instructions. At the end of a set time limit the students dictate their notes to the teacher, who writes them on the chalkboard or transparency in the imperative. When the students have completed the "Method" and are writing the "Method", they can be taught how to change from the imperative form to the past tense in the passive voice using the original instructions.

Objectives:

Content Objectives:

- To learn how to do and to write a science experiment incorporating the headings: materials, method, observation, conclusion and diagram.
- To understand how seeds sprout and grow into plants.

Language Objectives:

Skills:

- Listening - during the discussions
  - for oral instructions to complete the method
- Speaking - to give information
  - to themselves as they are writing what they did
- Reading - their experiments
- Writing - a science experiment

Linguistic Knowledge:

Vocabulary Development:

- materials, method, observation, conclusion, diagram, plastic, ziploc bag, bean seeds, paper towel, bubbles, moisture, wrinkly, soaked, dipped, peeled, folded, spread, sealed, sprouted, grew, shed

Structures:

- Subject verb agreement
- Singular/plural
- Imperative verb forms
- Passive Voice
- Past tense
- Sentence combining
- Conjunctions and sentence structure

Function:

- Writing a science experiment.

Learning Strategies:

Metacognitive Strategies:

- Advance Organization
- Selective Attention
- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Note Taking
- Inferencing
- Deduction/Induction
- Imagery
- Elaboration
- Transfer
- Auditory Representation

Social-Affective Strategies:

- Cooperation
- Asking questions for clarification
- Self-Talk

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Materials:

- Soaked bean seeds (soaked for 24 hours)
- Ziploc plastic bags
- Paper towels
- Pail of water
- Masking tape
- Science experiment worksheet

Procedures:

I. PREPARATION:

Soak the bean seeds in water for 24 hours.

Review the parts of the apple seeds -- coat, stored food, sprout.

Ask:

- Do you think all seeds have a coat, stored food and a sprout?

Give each student three soaked beans and tell them to peel the coats off to check their parts.

- Do the bean seeds have the same parts as the apple seeds? (yes)
- What are they? (coat, stored food and sprout)
- Was it easier to peel the apple seeds or the bean seeds? (bean seeds)
- Why were the bean seeds easier to peel? (They were softer.)
- What made the coat softer? (The coat was wet or soaked.)
- What do you think we are going to do with the rest of the soaked bean seeds? (a science experiment)
- Do you remember the parts of the celery experiment?

Write them on the board as the students say them. (Materials, Observation, Conclusion and Diagram)

- What does "Materials" mean? (What we used.)
- What does "Observation" mean? (What we saw happen.)
- What does "Conclusion" mean? (What we learned.)
- What does "Diagram" mean? (What it looked like.)

Write the definitions in brackets. Tell them we are going to add one more part to this experiment.

Ask:

- Can you guess what it will be? (If they cannot guess, tell them.)

"Method"

- What do you think the **Method** is? (What we did.)

Write this beside the word "Method".

[Advance Organization] *[Imagery]*
[Elaboration]

Imagery - using the bean seed to see the parts.
Elaboration - using prior knowledge from the celery experiment and the apple seeds and relating it to the bean seed experiment.

Strategy Instruction:

[Elaboration]--

Ask:

- Do you think it will be easy doing this science experiment? (yes)
- Why? (We already did one and know how to do experiments.)
- Do you think doing the celery experiment will help you when you do this experiment? (yes)

II. PRESENTATION:

Give each student a science experiment worksheet, 6 soaked bean seeds, a piece of paper towel, and a ziploc plastic bag. Have a pail of water in the room.

Ask:

- What have I just given you?
- Where would you write these things on your science experiment worksheet? (under "Materials")
- What will you write down? (6 soaked bean seeds, a paper towel, a plastic bag, water)
- What do you have to remember to put between each thing to separate them? (commas)
- Working with your partner, write down the four materials.

[Organizational Planning] *[Note Taking]* *[Cooperation]*
[Deduction/Induction]

Note taking - as they write the experiment.
Deduction/Induction - applying the rules as they are writing.
Cooperation - working together.

- Look at your experiment worksheets. What part of the experiment are we going to do now? (method)
- What does "Method" mean? (What we did.)

- Do you think we have to write it in the exact order as we do it? (yes)
- Why?

1. - What is the First thing we did? (soaked the beans)
- What will you write beside number 1 under method -- without using the words "I" or "we". We don't use the words "I" or "we" when writing experiments. Start your sentence with "The beans".

e.g. The beans were soaked for 24 hours.

The students write their sentences, working with their partners.

- How many beans were there? (6)
- What did you have to add to the word "bean" to show there were more than one? ("s")
- If you wrote the word "beans" did you write "was" or "were"? ("were")
- Why? ("Were" means more than one.)
- When do you use "was"? (If there is only one.)
- What does "soak" mean? (to stay in water for a long time)
- Do you ever "soak" in a pool or in a bathtub?
- What happens to your skin when you "soak" in water? (It gets wrinkly.)
- What did you have to add to the end of the word "soak" to show we already did it? (ed)
- What did you have to add to the word "hour" if it was for 24 hours? ("s")

[Selective Attention] *[Note Taking]* *[Cooperation]*
[Self-Monitoring] *[Deduction/Induction]*
[Inferencing]

Selective Attention - of special words
Self-Monitoring - as they are writing the experiment
Note Taking - as they write their experiment
Deduction/Induction - applying the rules as they write
Inferencing - guessing what to write
Cooperation - with their partner

2. - The Second thing you do is fold your paper towel into 4 quarters, dip it in the pail of water and put it into the plastic bag. The students follow the instructions and teacher's demonstration.

- What did you just do?

Working with your partner, write down what you just did beside the number 2, starting with the words "The paper towel".

e.g. The paper towel was folded, dipped into the water and put into a plastic bag.

e.g. The paper towel was folded. It was dipped into the water and put into a plastic bag.

These are examples. These are not written on the chalkboard because the students create their own sentences; however, they usually write exactly what we did. Refer the students to "Materials" for assistance.

Ask:

- How many sentences did you write?
- How did you write it all in one or two sentences?
- What word did you use to join sentences? ("and")
- What did you write on the first letter of your sentences? (capital)
- Did you write "was folded" or "were folded?" ("was folded")
- Why? (It was only 1 paper towel)
- What did you add to "fold" to show we already did it? ("ed")
- What did you add to "dip" to show we already did it? ("ed")
- If you just added "ed", what word would you get? (diped)
- How do you spell dipped? (add "p" and "ed")
- Did you add "ed" to put" (no)
- Why not? (don't need to. It is already past tense.)
- What kind of word is "into"? (compound)
- What two words are in "into"? ("in" and "to")
- What did you put at the end of your sentence(s)? (periods)

[Self-Monitoring]
[Self-Evaluation]

[Auditory Representation]
[Transfer]
[Note Taking]
[Imagery]
[Deduction/Induction]

[Cooperation]
[Asking Questions for Clarification]
[Self-Talk]

Self-Monitoring - as they are writing.
Self-Evaluation - as we discuss the writing.
Auditory Representation - when the second step was told to them. They would repeat the instructions to themselves as they follow the instructions.
Transfer - the oral instructions to do the experiment.
Note Taking - writing the experiment.
Imagery - doing the actual experiment helps them understand and remember what to write.
Deduction/Induction - applying the rules as they write and during our discussion.
Asking questions for clarification - when working with their partners.
Self-Talk - telling themselves what to write after they have just done it.

3. - The third thing you do is put your 6 bean seeds into the plastic bag on top of the paper towel. Spread them out so they are not touching. The students follow the instructions and the teacher's demonstration.

- What did you just do?

Working with your partner, write down what you just did.

- What will the first words of your sentence be? ("The beans")

e.g. The beans were put into the plastic bag on top of the wet paper towel.

- Did you write "beans were" or "beans was"? ("beans were")
- Why? (more than one bean)
- Where did you find the words you needed for your sentences? (under "Materials")

The words are already written for you under "Materials".

[Self-Monitoring]
[Self-Evaluation]

[Auditory Representation]
[Transfer]
[Note Taking]
[Imagery]
[Deduction/Induction]

[Cooperation]
[Asking questions for Clarification]
[Self-Talk]

4. - The Fourth or Last thing you do is seal your plastic bags. (The students follow the instructions and seal their plastic bags.)

- What happened to the plastic bag?
- Working with your partner, write it down.
- What will the first words start with? ("The plastic bag")

e.g. The plastic bag was sealed.

- What did you write?
- Did you write "was" or "were"? ("was")
- Why? (only one bag)
- What did you add to the end of seal? ("ed")
- Why? (We already sealed it.)
- What does "seal" mean? (close)
- Can you think of other things you seal? (envelopes, packages, etc.)

When the students are finished, tell them to print their names on masking tape and to tape them to the top of their plastic bags so they can see the bean seeds as they grow). Tell them to put their plastic bags on the window ledge until the next day when they will write their observations.

[Self-Monitoring]
[Self-Evaluation]

[Auditory Representation]
[Transfer]
[Note Taking]
[Imagery]
[Deduction/Induction]

[Cooperation]
[Asking Questions for Clarification]
[Self-Talk]

Strategy Instruction:

[Auditory Representation]--

Ask:

- When you were writing down the experiment or note taking, was it easier to do right after you actually did it?
- Why?
- When you were writing the method, did you say what you just did to yourself and write that down?
- Did you say it to yourself out loud or in your head?
- Does saying it to yourself make it easier to remember?

[Prediction]--

- Did guessing what would happen make it easier to remember?
- What is it called when you try to guess what will happen? (predict)
- Can you predict or guess what will happen to these bean seeds by tomorrow?

II. PRACTICE:

The next day the students will get their plastic bags and carefully carry them to their groups.

They will discuss what happened to the bean seeds with their partners and write their observations. The teacher will give cues when needed, as was done in the presentation stage of this lesson. This observation will continue for a few days until the beans have grown large enough to plant.

Before planting the beans the students:

a) write their conclusions
b) draw and label their diagrams.

[Self-Monitoring]

[Auditory Representation]
[Transfer]
[Note Taking]
[Imagery]
[Deduction/Induction]
[Prediction]

[Cooperation]
[Asking Questions for Clarification]
[Self-Talk]

IV. EVALUATION:

When the students have completed their experiments, they edit them with their partners. They show them to the teacher, who helps edit them for their final draft.

[Self-Evaluation]

[Deduction/Induction]

[Cooperation]
[Asking Questions for Clarification]

V. FOLLOW UP:

When the students have completed their final draft, they read it to the teacher.

Experiment Format

Materials (What we used)

Method: (What we did)

1.
2.
3.
4.

Observation: (What we saw happen)

Conclusion: (What we learned)

Diagram: (What it looked like)

Bean Experiment

Learning Log - Lesson 10

VOCABULARY I KNOW:

Experiment

_____ conclusion
_____ diagram
_____ materials
_____ method
_____ observation
_____ title

Materials

_____ bean seeds
_____ paper towel
_____ plastic ziploc bags
_____ water

Verbs

_____ dipped
_____ folded
_____ grew
_____ peeled
_____ sealed
_____ shed
_____ soaked
_____ spread
_____ sprouted

Observation

_____ bubbles
_____ moisture
_____ wrinkly

LANGUAGE:

I can:

_____ use "were" and "was"
_____ combine sentences
_____ write sentences in the past verb tense
_____ write a science experiment using materials, method, observation, conclusion and diagram

CONTENT:

I can:

_____ understand how seeds sprout and grow into a plant.
_____ do a science experiment.

LEARNING STRATEGIES:

I can:

_____ predict what will happen.
_____ do the experiment to help me understand.
_____ write notes of what I did.
_____ work with others to do the experiment.
_____ ask questions when doing the experiment.
_____ tell myself what do do as I do it.

Lesson 11: Food Chart (Science)

Objectives:

Content Objectives:

- To distinguish between fruits and vegetables.
- To distinguish between foods that grow underground, on plants, and on trees.

Language Objectives:

Skills:

- Listening - during the game to instructions
- Speaking - during the game to give information
- Reading - names of fruits and vegetables
- Writing - names of fruits and vegetables

Linguistic Knowledge:

Vocabulary Development:

- underground, plants, trees, fruits, apple, banana, strawberry, peach, cherry, watermelon, pear, tomato, vegetables, carrot, potato, corn, beet, radish, bean, onion

Structures:

- singular/plural

Functions:

- Classifying and naming fruits and vegetables.

Learning Strategies:

Metacognitive Strategies:

- Advance Organization
- Selective Attention
- Organizational Planning
- Self-Monitoring
- Self-Evaluation

Cognitive Strategies:

- Imagery
- Grouping

- Inferencing
- Elaboration

Social-Affective Strategies:

- Cooperation
- Asking questions for clarification

Materials:

- *Addison-Wesley ESL, Level B, Teacher's Edition*, Class Activity Master 7.
- Picture cards of fruits and vegetables with the names printed on the back.
- Large construction paper.
- Scissors
- Glue

This activity was suggested in *Addison-Wesley ESL, Level B, Teacher's Edition*, p. 157.

Procedures:

I. PREPARATION:

Show picture cards of fruits and vegetables. The students state whether they are fruits or vegetables, name them and say whether they grow:

a) underground
b) on plants
c) on trees

[Advance Organization]

[Imagery]
[Grouping]

Advance Organization - of what they will be doing in the lesson.
Imagery - using the picture cards to remember the names.
Grouping - the cards according to whether they are a fruit or a vegetable and where they grow.

Place the picture cards along the chalkboard ledge and play a game. A student from one team will name a fruit or vegetable to a student on the other team. To get a point, the student from the other team must:

a) Say whether it is a fruit or a vegetable.
b) Identify the picture card.
c) Say where it grows.

[Organizational Planning]
[Self-Monitoring]
[Selective Attention]
[Self-Evaluation]

[Inferencing]
[Imagery]
[Grouping]
[Elaboration]

[Cooperation]

Organizational Planning - this oral activity will become a written activity later in the lesson.
Self-Monitoring - as they are playing the game.
Selective Attention - to key words in the game.
Self-Evaluation - when they get or do not get the point.
Inferencing - guessing during the game.
Imagery - identifying the fruit or vegetable.
Grouping - the fruits and vegetables according to where they grow.
Elaboration - using what they know about plants and associating it with the new information of fruits that grow on trees.
Cooperation - during the game.

II. PRESENTATION:

Distribute the "Class Activity Master 7" from *Addison-Wesley ESL, Level B, Teacher's Edition*. Discuss all the fruits and vegetables, their names, their colors and where they grow. Refer the students to the picture cards used in the game for the names and colors when cues are needed. Distribute the picture cards between the groups.

[Organizational Planning]	*[Imagery]* *[Grouping]* *[Elaboration]*	*[Cooperation]* *[Asking Questions for Clarification]*

III. PRACTICE:

The students are instructed to:

1. Print the name of the fruit or vegetable under the picture.
2. Color the picture the correct color.

Ask:

- Where will you find the correct spelling of the fruits and vegetables? (on the back of the cards)
- Where will you find the correct color? (from the picture cards)
- If the picture has more than one fruit or vegetable, what do you have to remember to add? ("s")

Set a time limit for the task. When the students have completed the task they show it and read it to the teacher.

[Self-Monitoring]	*[Imagery]*

IV. EVALUATION:

When the students have completed the task, tell them to cut the pictures out. Distribute large pieces of construction paper with three columns and boxes drawn in. The students will complete the headings.

FOODS THAT GROW		
underground	**on plants**	**on trees**

The students group (lay) the pictures in the appropriate columns. They show them to the teacher before gluing them. They read the completed product to the teacher.

e.g. Foods that grow underground (are) ____________, ____________,

____________, ____________, ____________, (and) ____________.

[Self-Monitoring]
[Self-Evaluation]

[Imagery]
[Grouping]
[Inferencing]

[Cooperation]

Self-Monitoring - as they are grouping the pictures.
Self Evaluation - upon completion.
Imagery - grouping the pictures.
Grouping - the pictures according to where they grow.
Inferencing - guessing to complete the chart.

V. FOLLOW UP:

Strategy Instruction:

[Grouping]--

- How many fruits are there on your chart? (8)
- Name them.
- How many vegetables are there on our chart? (7)
- Name them.
- Where do most of the fruits grow? (on trees and on plants)

- Where do most of the vegetables grow? (underground and on plants)
- When you group pictures like this under their heading or classification, is it easier to remember? (yes)

[Imagery]--

- How did the pictures of the fruits and vegetables help you? (helped us remember their names and where they grow)
- Do pictures help you to remember? (yes)

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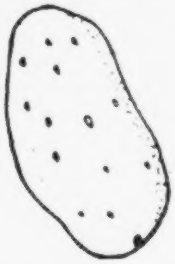
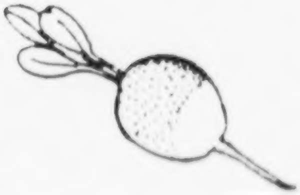
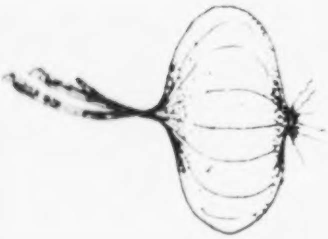
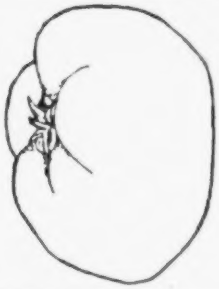
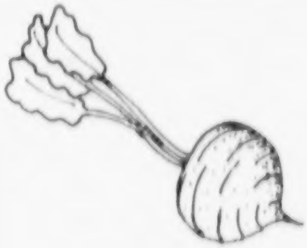
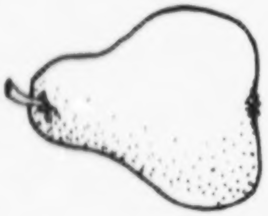
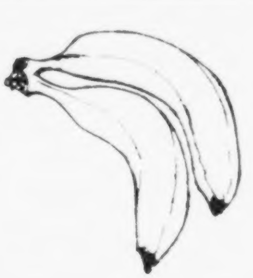
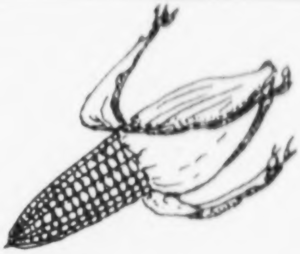
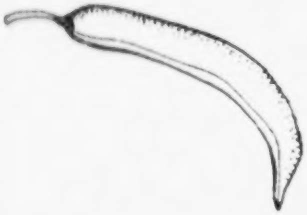
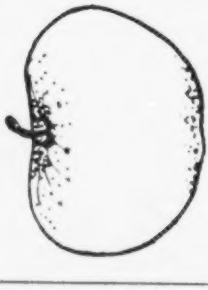
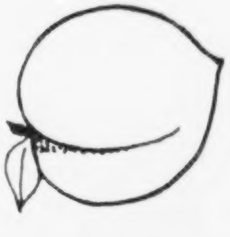
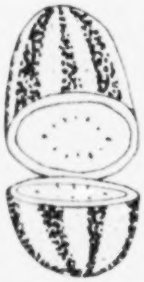
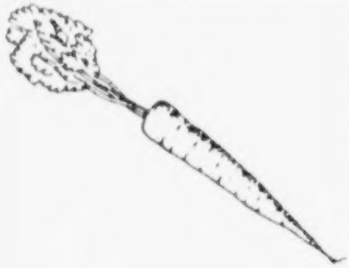
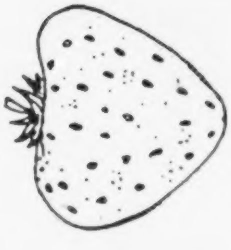
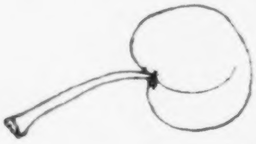
Fruits and Vegetables
See Teaching Plans for pages 27, 29, 72

CLASS ACTIVITY MASTER **7**

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from *Addison-Wesley ESL, Level B, Teacher's Edition*, p. 157

Food Chart

Learning Log - Lesson 11

VOCABULARY I KNOW:

Fruits

_____ apple
_____ bananas
_____ cherry
_____ pear
_____ peach
_____ strawberry
_____ tomato
_____ watermelon

Vegetables

_____ bean
_____ beet
_____ carrot
_____ corn
_____ onion
_____ potato
_____ radish

Grow

_____ plants
_____ trees
_____ underground

LANGUAGE:

I can:

_____ Read and write the names of fruits and vegetables.

CONTENT:

I can:

_____ Tell the difference between a fruit and a vegetable.
_____ Tell the difference between foods that grow underground, on plants, and on trees.

LEARNING STRATEGIES:

_____ Group pictures
_____ Name fruits and vegetables in the pictures.

Chapter 7

Practical Suggestions for Integrating ESL Students into the Regular Classroom

CHAPTER 7

Practical Suggestions for Integrating ESL Students into the Regular Classroom

Mainstream teachers concerned with integrating ESL students into their regular classrooms may find the following advice useful. These suggestions are of a general nature, and are intended to supplement the specific approach (Foresee) that we have advocated so far in this manual. Some of the ideas below are based on theoretical notions discussed in Chapter 1.

I. **CLASSROOM ORGANIZATION** (Levine, 1985)

We advocate a change of classroom organization from traditional whole class presentation followed by individual written assignments to:

Co-operative Learning Strategies - Children learn from their peers
(Jacob and Mattson, 1987)

Co-operative learning involves small groups of 2 to 6 students in tasks that require cooperation and positive interdependence among individuals of each group.

Evidence suggests that cooperative learning methods can contribute to student success and achievement in several important ways:

1. They provide opportunities for face-to-face interaction among students around school tasks. Current research in second language acquisition suggests that such interactions are important for acquiring a language. (Krashen, 1981a)

2. The methods raise students' academic achievement levels. (Slavin, 1983)

3. The methods improve intergroup relations and self-esteem. (Slavin, 1983)

The groups and the learning experiences are organized so that students become accountable for each others' learning and acquire effective group skills and learning strategies. (Coelho, 1987)

Teachers can:

1. arrange small groups or paired learning experiences.

2. pair ESL students with English buddies - sociable.

3. appoint several buddies with definite time limits.

4. set a definite goal and time limit for interactive arrangements.

5. assign activities which require interaction for completion. (Levine, 1985)

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II. SILENT PERIOD (Krashen & Terrell, 1983)

Be patient; allow a silent period during which speech is delayed or optional. (Krashen and Terrell, 1983)

There is usually a silent period for second language acquirers which may last a few hours to a few months. During the silent period acquirers build up competence by active listening, via comprehensible input. Speaking emerges after enough confidence has been developed through experience in listening and understanding.

III. RESPONSES

Accept non-verbal responses from beginning students.

According to Krashen and Terrell (1983), comprehension precedes production, and production emerges in stages -- starting with non-verbal responses. The acceptance of non-verbal responses will encourage the production of more evolved responses as the student progresses in language proficiency. Krashen and Terrell claim that students will progress through the following stages:

1. Non-verbal responses
2. Single word responses - yes/no
3. Phrases
4. 2-3 word responses
5. Sentences
6. More complex discourse

IV. CLASSROOM LANGUAGE (Coelho, 1987)

Teacher talk can be modified by:

a) Simplifying vocabulary

- Use everyday words - these are easier to understand because students read and hear these words more frequently.

b) Simplifying sentence structure

- Avoid complex sentences and passive verbs.

c) Avoiding or rephrasing idioms

- If you use idioms, rephrase them immediately so ESL students attach meaning to them.

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d) Repeating or rephrasing
   - key ideas and instructions

e) Making blackboard notes
   - to draw recognition to key ideas, new words, etc.

f) Providing visual support
   - Use plenty of pictures, films, charts, realia, etc.
   - These are meaningful, and provide immediate comprehensible input.

g) Repeating or rephrasing students' responses if they contain incorrect grammar or pronunciation.
   - Model - without drawing specific attention to technical details.

V. **ERRORS** (Coelho, 1987)

Try to focus on consistent errors of a specific type and concentrate on only those errors. You cannot target each and every error -- that would be too overwhelming. **DO RESPOND TO CONTENT - FIRST !!!**

VI. **READING ACTIVITIES** (Coelho, 1987)

Use directed reading activities so students read with a purpose; otherwise, reading is just a translation exercise. Suggested sequence:

a) Preview the text
   - Look over the heading, illustrations, etc. and discuss.

b) Provide a pre-reading question
   - about the main idea
   - Students skim to get the general impression of the topic.

c) Provide questions which will refer the students back to the text
   - details and inferences

d) Instruct students to find specific words in context
   - make inferences about their meaning

e) Refer students to their dictionaries
   - to clarify meaning

(Carrell & Eisterhold, 1983)

Minimize reading difficulties and maximize comprehension by providing culturally relevant information. This can be done by manipulating:

a) Text:

1. Use the Language Experience Approach (Rigg, 1981)
   - for beginning readers
   - Uses students' ideas and words in preparation of beginning reading materials.
   - Students can read what they just said.

2. Encourage narrow reading (Krashen, 1981b)
   - Confine to a single author or a single topic.
   - Selections are easier to read as the students become familiar with terms and author style, so that comprehension tends to improve after several pages.
   - Repetitions of vocabulary and structure occur and review is built into the materials.

3. Develop materials (Paulston and Bruder, 1976)
   - Use texts with local settings and specialized low-frequency vocabulary, e.g., student or local newspapers, pamphlets, brochures, booklets about local places of interest.

4. Sustained Silent Reading
   - Use student-selected texts they are interested in reading.

b) Reader:

1. Provide background information pertaining to the content of reading passages. (Hudson, 1982)

2. Use illustrations and examples.

3. Preview content
   - Teach key concepts, especially those that are culturally loaded.
   - Explain specialized vocabulary.
   - Prepare students for organizational (discourse) structures that might cause difficulties.

4. Listen to what readers say about the texts.
   - Use open-ended questioning, probe for inferences from the text, and ask students to justify their answers to direct questions.
   - have students provide oral or written summaries of what they have read.

VII. **ADAPT INSTRUCTION** (Krashen and Terrell, 1983)

To provide "optimal input" is to provide means for aiding comprehension by:

a) Using caretaker speech - always a bit beyond their level

b) Utilizing pictures, good visuals

c) Making use of familiar topics - students can guess at meanings

d) Teaching students to regulate input, e.g. by asking for clarification, by requesting that you explain or slow down, by asking for repetition

e) Adjusting difficulty level of content - not far above i + 1 level (Krashen, 1981a).

f) Checking comprehension, e.g. asking students if they understand and noting their responses

g) Providing students with a large amount of intake without forcing production

h) Being aware of specific vocabulary needs and focusing on them

i) Encouraging student interaction.

REFERENCES

Carrell, P.L. & J.C. Eisterhold (1983). Schema theory and ESL reading pedagogy. *TESOL Quarterly,* 17(4), 553-573.

Coelho, E. (1987). *Working with ESL/SESD students in the regular subject classroom.* Toronto: North York Board of Education.

Hudson, T. (1982). The effects of induced schemata on the "short circuit" in LE reading: non-decoding factors in L2 reading performance. *Language Learning,* 32(1), 1-31.

Jacob, E. & B. Mattson (1987). Cooperative learning with limited-English-proficient students. Q & A. Washington, DC: ERIC/CLL Center for Language Education and Research. [ERIC ED 287 516].

Krashen, S.D. (1981a). *Second language acquisition and second language learning.* Oxford: Pergamon.

Krashen, S.D. (1981b). The case for narrow reading. *TESOL Newsletter,* 15(6), 23.

Levine, L.N. (1985). Content area instruction for the elementary school ESL student. In P. Larson, E.L. Judd, & D.S. Messerschmitt (Eds.), *On TESOL '84: A brave new world for TESOL* (pp. 233-240). Washington, DC: TESOL.

Paulston, C.B. & M.N. Bruder (1976). *Teaching English as a second language: techniques and procedures.* Cambridge, MA: Winthrop.

Rigg, P. (1981). Beginning to read in English the LEA way. In C.W. Twyford, W. Diehl, & K. Feathers (Eds.), *Reading English as a second language: Moving from theory to practice* (pp. 81-90). Monographs in language and Learning Studies 4. Bloomington, IN: Indiana University Press.

Slavin, R. (1983.). *Cooperative Learning.* New York: Longman.

NOTE: For additional information on the topic of Integrating ESL and Content Instruction Using the Foresee Approach, contact Multicultural Educational Collection Assistance, Manitoba Education and Training, Main Floor, Robert Fletcher Building, 1181 Portage Avenue, Winnipeg, Manitoba R3G 0T3, telephone: (204) 945-4015.